



GRI G4 REPORT

2016 CORPORATE ACCOUNTABILITY REPORT



2016 Global Reporting Initiative

AEP follows the [Global Reporting Initiative](#) (GRI) G4 reporting principles in terms of data quality, report content and organizational boundaries. This report was developed according to the fourth generation of GRI's Sustainability Reporting Guidelines, otherwise known as G4. The GRI guidelines provide a voluntary reporting framework used by organizations around the world as the basis for sustainability reporting. We also responded using the Electric Utility Sector Supplement for reporting on industry-specific information.



| G4 Indicator | Description | Report Location |
|-------------------------------|---|---|
| Strategy and Analysis | | |
| G4-1 | Statement from the most senior decision-maker | Message from the Chairman |
| G4-2 | Description of key impacts, risks, and opportunities | 2015 Form 10-K Risk Factors pg. 33 Managing Risk Carbon Profile Analysis Strategy for Growth |
| Organizational Profile | | |
| G4-3 | Name of the organization | See homepage |
| G4-4 | Primary brands, products, and/or services | About Us |
| G4-5 | Location of organization's headquarters | Columbus, OH About Us |
| G4-6 | Countries in which the company has operations | About Us |
| G4-7 | Nature of ownership and legal form | 2015 Form 10-K pg. 1 |
| G4-8 | Markets served | 2015 Form 10-K pg. 1 |
| G4-9 | Scale of the reporting organization | AEP Fast Facts |
| G4-10 | Total number of employees by employment contract & gender | 17,405 (see appendix 1) |
| G4-11 | Total employees covered by collective bargaining agreements | Labor Relations |
| G4-13 | Significant changes in organizations size, structure, ownership, or its supply chain | 2015 Form 10-K pg. 31 |
| G4-14 | Explanation of whether and how the precautionary approach or principle is addressed by the organization | 2015 Form 10-K Risk Factors pg. 33 Managing Risk Carbon Profile Analysis |
| G4-16 | Memberships of associations and national or international advocacy organizations | Lobbying & Political Contributions |

| Identified Material Aspects and Boundaries | | |
|---|--|--|
| G4-17 | Operational structure of the organization | About Us or 2015 Form 10-K pg. 1 |
| G4-18 | Process for defining report content | Sustainability Governance Material Issues |
| G4-19 | Material aspects identified in the process for defining report content | Material Issues |
| G4-20 | Material aspect boundaries within the organization for the report | Material Issues |
| G4-21 | Material aspect boundaries outside the organization for the report | Material Issues |
| G4-22 | Explanation of the effect of any re-statements of information provided in earlier reports | No significant re-statements |
| G4-23 | Significant changes from previous reporting periods in the scope, boundary, or measurement methods applied in the report | No significant changes |
| Stakeholder Engagement | | |
| G4-24 | Stakeholder groups engaged by the organization | Stakeholder Engagement |
| G4-25 | Identification and selection of stakeholders | Stakeholder Engagement Resource Planning |
| G4-26 | Approaches to stakeholder engagement | Stakeholder Engagement Resource Planning |
| G4-27 | Key topics and concerns raised through stakeholder engagement | Stakeholder Engagement Resource Planning |
| Report Profile | | |
| G4-28 | Reporting period | 2015 and early 2016 About This Report |
| G4-29 | Date of most recent previous report | About This Report |
| G4-30 | Reporting cycle | About This Report |
| G4-31 | Contact point for questions regarding the report | Contact Us |
| G4-32 | Table identifying the location of the Standard Disclosures in the report | GRI Index |
| G4-33 | Policy and current practice with regard to seeking external assurance for the report | About This Report |
| Governance | | |
| G4-34 G4-38 | Governance structure of the organization | AEP Leadership |
| G4-36 | Appointed executive-level position with responsibility for sustainability topics | AEP Leadership |

| | | |
|-----------------------------|---|--|
| G4-37 | Stakeholder consultation process on economic, environmental and social topics | Stakeholder Engagement |
| G4-38 | Composition of the highest governance body and its committees | Board of Directors |
| G4-39 | Indicate whether the Chair of the highest governance body is an executive officer | Corporate Governance |
| G4-40 | Process for determining the composition, qualifications, and expertise of the members of the highest governance body | AEP's Principles of Corporate Governance |
| G4-41 | Processes for the highest governance body to ensure conflicts of interest are avoided | AEP's Principles of Corporate Governance |
| G4-42 | The Board's and senior executive's roles in the development, approval and updating purpose, values or mission statements, strategies, policies, and goals related to sustainability | Board Statement |
| G4-43 | Measures taken to develop and enhance the Board's knowledge of sustainability topics | Board Statement |
| G4-44 | Processes for evaluating the highest governance body's own performance | AEP's Principles of Corporate Governance |
| G4-45 G4-47 | Board-level processes for identifying and managing risks and opportunities and frequency | Enterprise Risk Management |
| G4-46 | Board oversight of sustainability risk management | Board Statement |
| G4-48 | Highest committee or position that reviews and approves the sustainability report | Board Statement |
| G4-49 G4-53 | Mechanisms for shareholders and employees to provide recommendations to the highest governance body | Corporate Leaders & Governance |
| G4-50 | Nature and number of critical concerns communicated to the Board | 2016 Proxy |
| G4-51 | Linkage between compensation and the organization's performance | 2016 Proxy Statement |
| G4-52 | Process for determining remuneration | 2016 Proxy pg. 30 |
| Ethics and Integrity | | |
| G4-56 | Organization's values, principles, standards and norms of behavior (codes of conduct and ethics) | Mission, Values & Strategy AEP's Principles of Business Conduct |
| G4-57 | Mechanisms for seeking advice on ethical and lawful behavior | AEP's Principles of Business Conduct |
| G4-58 | Mechanisms for reporting concerns about unethical or unlawful behavior | AEP's Principles of Business Conduct |
| Economic | | |
| G4-EC1 | Direct economic value generated and distributed | Economic & Business Development Performance Summary |
| G4-EC2 | Financial implications and other risks and opportunities for the | Carbon Profile Analysis |

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| | organization's activities due to climate change | |
| G4-EC3 | Coverage of the organization's defined benefit plan obligations | 2015 Form 10-K pg. 196 |
| G4-EC4 | Financial assistance received from government | 2015 Form 10-K Annual - Financial Condition pg. 35 |
| G4-EC5 | Ratios of standard entry level wage by gender compared to local minimum wage | See appendix 2 |
| G4-EC6 | Proportion of senior management hired from the local community | See appendix 3 |
| G4-EC7 | Development and impact of infrastructure investments and services provided primarily for public benefit | See appendix 4 |
| G4-EC8 | Significant indirect economic impacts | Coal Unit Retirements Economic & Business Development AEP's Performance Summary Natural Resources |
| G4-EC9 | Proportion of spending on local suppliers | Sustainable Procurement See appendix 5 |
| Environmental | | |
| Guidance | Strategies, current actions, and future plans for managing impacts on biodiversity | Natural Resources |
| G4-EN3 | Direct energy consumption within the organization by primary energy source | See appendix 6 |
| Water | | |
| G4-DMA | Collaborative approaches to managing watersheds and reservoirs for multiple uses and long-term planning for securing water resources | See appendix 7 |
| G4-EN8 | Total water withdrawal by source | See appendix 8 |
| G4-EN9 | Water sources significantly affected by withdrawal of water | See appendix 9 |
| G4-EN10 | Percentage and total volume of water recycled and reused | See appendix 10 |
| Biodiversity | | |
| G4-DMA | Approaches for vegetation management along transmission corridors | See appendix 11 |
| G4-EN11 | Operational sites owned, leased, managed in, or adjacent to protected areas, and areas of high biodiversity value outside protected areas | See appendix 12 |
| G4-EN12 | Description of significant impacts of activities, products, and services on biodiversity | See appendix 13 |
| G4-EN13 | Habitats protected or restored | Natural Resources See appendix 14 |
| G4-EN14 | Total number of IUCN red list species and national conservation list | See appendix 15 |

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| | species with habitats in areas affected by operations | |
| Emissions | | |
| G4-EN15 | Direct and greenhouse gas emissions (scope 1) | Emissions Carbon & Climate |
| G4-EN19 | Reduction of greenhouse gas emissions | Emissions Carbon & Climate |
| G4-EN20 | Emissions of ozone-depleting substances | Emissions Carbon & Climate |
| G4-EN21 | NO _x , SO _x , and other significant air emissions by type and weight | Emissions Carbon & Climate |
| Effluents and Waste | | |
| G4-DMA | Effluents and Waste | See appendix 16 |
| G4-EN22 | Total water discharge by quality and destination | Toxics Release Inventory |
| G4-EN23 | Total weight of waste by type and disposal method | Waste & Chemical Management |
| G4-EN24 | Total number and volume of significant spills | Waste & Chemical Management |
| G4-EN25 | Weight of transported, imported, exported or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III and VIII | Waste & Chemical Management |
| G4-EN26 | Identify, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff | See appendix 17 |
| G4-EN29 | Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations | |
| G4-EN31 | Total environmental protection expenditures and investments | Coal Fleet Transition 2015 Form 10-K – Environmental Investments pg. 13 |
| Labor Practices and Decent Work | | |
| G4-LA1 | Total number and rate of employee turnover by age group, gender and region | See appendix 18 |
| G4-LA2 | Benefits provided to full-time employees that are not provided to temporary or part-time employees | Pay & Benefits also see appendix 19 |
| G4-LA3 | Return to work and retention rates after parental leave | See appendix 20 |
| G4-LA4 | Minimum notice periods regarding operational changes | Two-weeks (where applicable) |
| G4-LA6 | Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region | Safety & Health Performance |
| G4-LA8 | Health and safety topics covered in formal agreements with trade unions | Yes |

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| G4-LA9 | Average hours of training per year per employee | See appendix 21 |
| G4-LA10 | Programs for skills management and lifelong learning | See appendix 22 |
| G4-LA11 | Percentage of employee receiving regular performance and career development reviews | See appendix 23 |
| G4-LA12 | Composition of governance bodies and breakdown of employees per category according to gender, age group, minority group membership, and other indicators of diversity. | Diversity at AEP See appendix 24 |
| G4-LA13 | Ratio of basic salary and remuneration of women to men | See appendix 25 |
| Human Rights | | |
| G4-HR2 | Total hours of employee training on human rights policies | See appendix 26 |
| G4-HR3 | Total number of incidents of discrimination and corrective actions taken | See appendix 27 |
| G4-HR4 | Operations and suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk | Labor Relations or see appendix 28 |
| Society | | |
| Guidance | Public policy positions and participation in public policy development and lobbying | Lobbying & Political Activity |
| G4-SO2 | Operations with significant actual and potential negative impacts on local communities | Environmental Performance |
| G4-SO4 | Communication training on anti-corruption policies and procedures | AEP's Principles of Business Conduct |
| G4-SO6 | Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country | Political Contributions & Lobbying Activity |
| Product Responsibility | | |
| G4-PR5 | Results of surveys measuring customer satisfaction | Customer Satisfaction See appendix 29 |
| Electric Utility Sector Supplement | | |
| G4-EU1 | Installed capacity (MW) | 2015 Form 10-K pgs. 43-465 |
| G4-EU2 | Net energy output (GWh) | TBD |
| G4-EU3 | Number of residential, industrial, institutional, and commercial customer accounts | 2015 AEP Fact Book pgs. 53-88 |
| G4-EU4 | Length of transmission and distribution lines | Reliability Investments |
| Electric Utility Sector Supplement - Economic | | |
| G4-DMA | Management approach to ensure short- and long-term electricity availability and reliability | Reliability Investments Grid Security Enterprise Security Strategy for Growth |

| | | |
|---|---|---|
| G4-DMA | Demand-side management programs | Energy Efficiency/Demand Response Volt Var Energy Storage Appendix 30 |
| G4-DMA | Research and development activity and expenditure aimed at providing reliable electricity and promoting sustainable development | Technology & Innovation Technology Breakthroughs Big Data & Analytics |
| G4-DMA | Provisions for decommissioning of nuclear power sites | 2015 Form 10-K pg. 17 |
| EU10 | Planned capacity against projected electricity demand over the long term | Powering the Future |
| EU12 | Transmission and distribution losses as a percentage of total energy | See appendix 31 |
| Electric Utility Sector Supplement - Environmental | | |
| EU13 | Biodiversity of offset habitats compared to the biodiversity of the affected area | See appendix 32 |
| Electric Utility Sector Supplement – Labor Practices and Decent Work | | |
| G4-DMA | Programs and processes to ensure the availability of a skilled workforce | Workforce Planning & Optimization Training or see appendix 33 |
| EU15 | Percentage of employees eligible to retire in the next 5 and 10 years | See appendix 34 |
| G4-DMA | Policies and requirements regarding health and safety of employees and employees of contractors and subcontractors | Path to Zero Harm Contractor Safety & Health or see appendix 35 |
| Electric Utility Sector Supplement – Society | | |
| G4-DMA | Stakeholder participation in the decision making process related to energy planning and infrastructure development | Stakeholder Engagement |

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| G4-DMA | Approach to managing the impacts of displacement | See appendix 36 |
| G4-DMA | Contingency planning measures, disaster/emergency management plan and training programs, and recovery/restoration plans | Business Continuity |
| EU22 | Number of people physically or economically displaced and compensation, broken down by type of project | See appendix 37 |
| Electric Utility Sector Supplement – Product Responsibility | | |
| G4-DMA | Programs, including those in partnership with government, to improve or maintain access to electricity and customer support services | Energy Assistance |
| G4-DMA | Practices to address language, cultural, low literacy and disability related barriers to accessing and safely using electricity and customer support services | See appendix 38 |
| EU25 | Number of injuries and fatalities to the public involving company assets | Public Safety |
| EU27 | Number of residential disconnections for non-payment | See appendix 39 |
| EU28 | Power Outage Frequency | Energy Reliability |
| EU29 | Average power outage duration | Energy Reliability |

2016 Corporate Accountability Report – GRI Report Appendix

Appendix 1: G4-10 - Total number of employees by employment contract & gender

Total Employment By Contract & Gender

| Reg/Temp | Full/Part | Male | Female |
|-----------|-----------|--------|--------|
| Regular | Full-time | 14,329 | 3,102 |
| Regular | Part-time | 1 | 27 |
| Temporary | Full-time | 3 | 4 |
| Temporary | Part-time | 1 | 1 |

Total # of Employees By State & Gender

| State | Male | Female |
|-------|-------|--------|
| AR | 329 | 28 |
| DC | 3 | 4 |
| IL | 70 | 5 |
| IN | 886 | 173 |
| KY | 346 | 38 |
| LA | 747 | 236 |
| MI | 1,133 | 185 |
| MO | 1 | 1 |
| NE | 21 | 2 |
| OH | 4,688 | 1,383 |
| OK | 1,264 | 310 |
| PA | 15 | 2 |
| TN | 63 | 8 |
| TX | 2,094 | 322 |
| VA | 853 | 123 |
| WV | 1,821 | 314 |

Appendix 2: G4-EC5 - Ratios of standard entry level wage by gender compared to local minimum wage

AEP does not have a standard entry-level wage. However, AEP's 2015 actual lowest starting wages were 131% - 278% compared to local minimum wages.

| State | Minimum Wage- 2016 | Female | | Male | |
|---------------|--------------------|--------------------|---------|--------------------|---------|
| | | Starting Rate 2015 | Percent | Starting Rate 2015 | Percent |
| Ohio | \$8.10 | \$13.15 | 162% | \$13.15 | 162% |
| Michigan | \$8.50 | \$19.83 | 233% | \$16.00 | 188% |
| Indiana | \$7.25 | \$15.66 | 216% | \$15.66 | 216% |
| Virginia | \$7.25 | \$19.47 | 269% | \$9.50 | 131% |
| West Virginia | \$8.75 | \$12.90 | 147% | \$14.16 | 162% |
| Kentucky | \$7.25 | \$18.90 | 261% | \$16.37 | 226% |
| Tennessee | \$7.25 | \$18.27 | 252% | \$18.27 | 252% |
| Texas | \$7.25 | \$12.90 | 178% | \$12.90 | 178% |
| Oklahoma | \$7.25 | \$13.00 | 179% | \$13.00 | 179% |
| Arkansas | \$8.00 | \$21.63 | 270% | \$22.20 | 278% |
| Louisiana | \$7.25 | \$13.86 | 191% | \$12.75 | 176% |

These numbers are based on a range of the ratios of the paid wage to the minimum wage.

Appendix 3: G4-EC6 - Proportion of senior management hired from the local community

While the selection of staff and senior management is based on a range of considerations, it is the company's policy to try to fill vacancies from within the organization. Leadership, knowledge, performance and diversity are some of the factors considered in making selection decisions. Every effort is made to promote from within the organization; however, there are instances when the uniqueness of job requirements or skills necessitate expanding outreach to areas outside of the company or our service territory. During 2015, one of the company executives (VP, SVP, EVP and Presidents) was selected from outside of the organization. Local is defined as the AEP service territory, which includes portions of 11 states.

Appendix 4: G4-EC7 – Understanding and describing significant indirect economic impacts, including the extent of impacts

AEP's investments and services have a significant beneficial impact on the areas where they take place. Each year, the company invests billions of dollars in generation, transmission and distribution infrastructure to ensure reliable electric service to the communities and customers that AEP serves.

In 2015, the company spent approximately \$747 million for general capital improvements to its existing generating fleet, for new power generating capacity, and for environmental improvement projects designed to enhance the environmental performance of its existing power plants. AEP also invested approximately \$969 million in transmission infrastructure including investments to enhance reliability, allow for prudent asset replacements and to improve customer service. The company's distribution organization invested \$1.1 billion dollars for customer service improvements, asset enhancement, reliability, system restoration and other major initiatives. In the aggregate, these investments, along with other corporate capital improvements, represent an investment in infrastructure of nearly \$4.5 billion.

These investments supported local economies through the addition of local tax revenues, the impact of additional temporary and permanent jobs and numerous permanent jobs, and the development of infrastructure to support business development.

In addition, AEP supports a comprehensive community involvement program that allows the company to fulfill its primary community relations objective – “to support and play an active, positive role in the communities where we live and work.”

AEP CAPITAL INVESTMENTS

\$ in millions

| | 2015 Actual | 2016 Projected |
|---|----------------|-------------------|
| Transmission* | \$969 | \$1,079 |
| Distribution | \$1,123 | \$1,334 |
| Regulated Environmental Generation | \$535 | \$312 |
| Regulated Fossil/Hydro Generation | \$212 | \$322 |
| Nuclear | \$202 | \$212 |
| Corporate and Other | \$198 | \$278 |
| Competitive Operations | \$139 | \$217 |
| AEP Transmission Holding Co. | \$1,182 | \$1,245 |
| Total Capital & Equity Contributions | \$4,561 | \$5,000 |

* Includes Vertically Integrated Utilities and T&D Utilities

Excludes AFUDC debt and equity and cash flow adjustments

These efforts include educational initiatives designed to advance our communities’ understanding of energy and energy-related issues. They also include the contributions of AEP, its operating companies and the AEP Foundation – the latter a permanent, ongoing resource for charitable initiatives involving higher dollar values and multi-year commitments in the communities we serve. In 2015, AEP corporate and Foundation giving totaled more than \$13.5 million to philanthropic activities including civic, charitable and educational grants.

Appendix 5: G4-EC9 – Proportion of spending on local suppliers

One way we can be a leader in supply chain and procurement practices is by ensuring we have a [diverse supplier base](#). Increasingly, we are receiving inquiries about our supplier diversity program. This is an area we are working to expand beyond a compliance-based program towards best practice. We believe that having a strong, diverse pool of suppliers is as important to AEP as it is to the business owners in our communities who want to do business with us. We are strengthening this network by identifying and helping to qualify small, diverse and competitive suppliers to be part of AEP’s supplier portfolio to compete for our business.

Currently, AEP has no formal policy to give preference to locally-based suppliers. When appropriate, Procurement does work with operating company personnel to obtain competitive bids from qualified suppliers within the operating company geographic area. The driving factor on most equipment and material purchases principally, is total cost of ownership. Factors reviewed in such circumstances include, but are not limited to: quality, warranty, safety, first cost, maintenance costs, environmental compliance, etc. The driving factor for service contracts principally is the scope-of-work, which includes, but is not limited to: similar elements as above for equipment and material. Geographic location is a higher-weighted factor when determining freight charges and/or logistics.

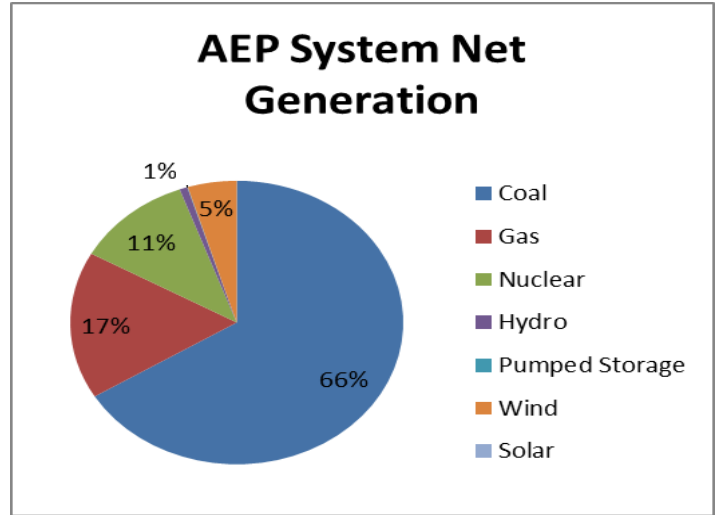
We are building a business plan to establish a program that will lead us to best practice for supplier diversity. This will add value to AEP and the local communities and economies where we conduct business and where our employees live and work. It will also help us achieve the cost savings and level of service we expect and need from our suppliers.



Appendix 6: G4-EN3 - Direct energy consumption within the organization by primary energy source

| 2015 | Net Generation MWH | Heat Input MBtu |
|------|-----------------------|--------------------|
|------|-----------------------|--------------------|

| | | |
|---|--------------------|-------------|
| Total System: | | |
| Coal | 96,431,041 | 981,845,212 |
| Gas | 24,454,947 | 184,362,879 |
| Regulated: | | |
| Coal | 69,108,851 | 700,213,817 |
| Gas | 11,471,886 | 90,793,474 |
| Unregulated: | | |
| Coal | 27,322,190 | 281,631,395 |
| Gas | 12,983,061 | 93,569,405 |
| | | |
| Nuclear | 16,519,124 | |
| Hydro | 1,118,061 | |
| Pumped Storage | 66,377 | |
| Wind | 6,911,522 | |
| Solar | 14,589 | |
| | | |
| Total AEP Owned Generation | 145,515,661 | |



Appendix 7: G4-DMA Water - Collaborative approaches to managing watersheds and reservoirs for multiple uses (irrigation, drinking water, ecosystem conservation, etc.) and long-term planning for securing water resources.

In order to manage watersheds and reservoirs for uses such as irrigation, navigation, industrial water supply, and ecological conservation, it often requires the participation and collaboration of multiple participants. Watersheds cover miles of streams and thousands of acres of land, necessitating that the water users and property owners work together. In addition, planning for long-term water uses requires the participation of multiple stakeholders. AEP is no exception to this requirement and collaborates with many stakeholders when securing its ability to use and manage the water within a watershed. To illustrate such collaboration, two examples are provided.

Ohio River

AEP operates generating facilities and a barge fleet on the Ohio River and its tributaries. The fleet and facilities need access to a reliable and clean source of water in order to move commodities and generate electricity. Water quality in the Ohio River Basin can be affected by many sources including power plants, municipal sewage treatment plants, urban storm water, and agriculture. Fertilizer and manure applications can release excessive amounts of nutrients into local watersheds. These can degrade water quality, potentially causing human illness and harming aquatic ecosystems. Due to the many sources and high nutrient loading in some areas, improving water quality requires collaboration among national and state agencies, wastewater treatment plants, farmers, environmental groups, and others. In addition, coordinated efforts among state, regional and federal regulatory

agencies are critical to addressing how interstate management of the river can occur. In order to address the need for coordination and collaboration across a diverse set of stakeholders, the Electric Power Research Institute (EPRI) assembled a group of strategic collaborators, including AEP, to develop and implement a nutrient-based [water quality trading program](#) during 2012.

Access to Water

An example of long-term planning to secure water resources includes AEP's work in the southwest, which periodically experiences drought conditions. When the AEP cooling lakes in Arkansas, Louisiana and Texas were designed, it was known that the associated watershed had a limited yield during drought periods. Therefore, AEP has contracted with a more senior water right holder to ensure sufficient access to cooling water.

East Texas is also a part of the country that may have future water issues that AEP will address in a regional water planning process. As the Dallas-Fort Worth area continues to grow, residents will need additional access to water and planners may look towards the eastern part of the state. At some point, they could come into the Cypress River Basin and compete with the water needs of AEP. The regional water planning efforts are conducted on a county-wide basis and in some cases, below the county level. AEP has been involved with this planning process since it was initiated almost 20 years ago and will continue to participate to ensure adequate access to water.

Appendix 8: G4-EN8 – Total water withdrawal by source

Steam Electric Facilities

Water is critical to the operation of most power generating facilities for steam production and plant cooling purposes. Power plants withdraw, but do not consume, large amounts of water. The largest AEP once-through cooled plants can withdraw up to 2 billion gallons of water per day from the source water body when operated at maximum design flows.

Despite the large withdrawal of water at AEP power plants (Figure 1), most of the water is used for once-through cooling in steam condensers and is returned to the source water body almost immediately. While closed-cycle cooling facilities consume water due to evaporation in the cooling towers, they withdraw much less water to produce electricity. For example, in 2015 the Rockport Plant (a closed-cycle facility) withdrew 601 gallons of water to produce a megawatt hour (MWh) of electricity, while the Cook Plant (a once-through cooled facility) withdrew 46,335 gallons per MWh (Table 1). Water used for other purposes, such as coal ash removal, steam make-up, or equipment cooling, is also returned to the source water bodies. However, this water must first be treated to meet effluent limits specified in National Pollutant Discharge Elimination System (NPDES) permits before it can be released to the source water bodies.

***Source Information** - Data is initially collected from plant staff and used to complete Form EIA-923 (formerly EIA-767). Plant staff determine water withdraw rates in a variety of ways, but essentially they base their estimates on GADS generation data and use a conversion factor (gals/MW) to determine water volume used. Others may use the number of pumps in service and assume a pumping rate. In general, pump meters are not used.*

Figure 1 - Water withdrawal and consumption at AEP steam electric plants

AEP'S WATER WITHDRAWAL & CONSUMPTION

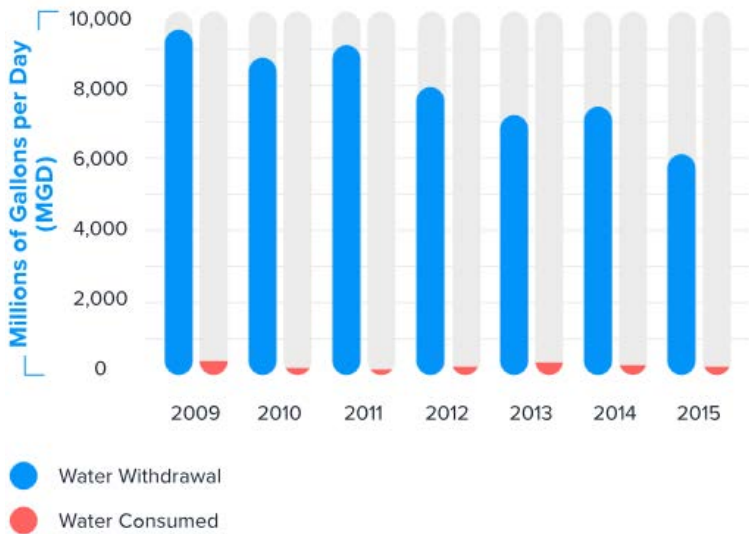


Table 1 - AEP 2015 power plant water withdrawals*

| Facility | State | Type | Water Source | Water Withdrawal 2015 (m3) | MGD | Gals/MWH |
|--------------------|-------|---------|--------------------|----------------------------|---------|----------|
| Amos | WV | Coal | Kanawha River | 45,961,417 | 33.3 | 863 |
| Arsenal Hill/Stall | LA | Gas | 12 Mile Bayou | 2,278,573 | 1.6 | 166 |
| Big Sandy | KY | Coal | Big Sandy River | 9,444,939 | 6.8 | 797 |
| Cardinal | OH | Coal | Ohio River | 1,155,803,021 | 836.5 | 34,556 |
| Ceredo | WV | Gas | Municipal - Kenova | | | |
| Clinch River | VA | Coal | Clinch River | 14,303,550 | 10.4 | 8,179 |
| Comanche | OK | Gas | Lawton POTW | 2,730,341 | 2.0 | 1,995 |
| Conesville | OH | Coal | Muskingum River | 77,544,124 | 56.1 | 3,965 |
| Cook | MI | Nuclear | Lake Michigan | 2,897,432,308 | 2,097.0 | 46,335 |
| Darby | OH | Gas | Ground water | | | |
| Dresden | OH | Gas | Muskingum River | 3,948,750 | 2.9 | 252 |
| Flint Creek | AR | Coal | SWEPCO Lake | 501,662,634 | 363.1 | 43,574 |
| Gavin | OH | Coal | Ohio River | 107,893,270 | 78.1 | 2,011 |
| Glen Lyn | VA | Coal | New River | 58,922,367 | 42.6 | 230,319 |
| Greenville | OH | Gas | Groundwater | | | |
| Kammer | WV | Coal | Ohio River | 84,780,692 | 61.4 | 85,151 |
| Kanawha River | WV | Coal | Kanawha River | 123,143,324 | 89.1 | 59,894 |
| Knox Lee | TX | Gas | Lk. Cherokee | 367,986,398 | 266.3 | 948,537 |
| Lawrenceburg | IN | Gas | Tanners Creek | 4,754,475 | 3.4 | 185 |
| Lieberman | LA | Gas/oil | Caddo Lake | 39,735,748 | 28.8 | 210,607 |

| Facility | State | Type | Water Source | Water Withdrawal 2015 (m3) | MGD | Gals/MWH |
|--------------------------------------|-------|----------|--------------------|----------------------------|----------------------|-------------|
| Lone Star | TX | Gas/oil | Ellison Creek Res. | 7,451,428 | 5.4 | 355,896 |
| Mattison | AR | Gas | Ground water | | | |
| Mitchell | WV | Coal | Ohio River | 20,084,828 | 14.5 | 989 |
| Mone | OH | Gas | Ground water | | | |
| Mountaineer | WV | Coal | Ohio River | 16,518,560 | 12.0 | 585 |
| Muskingum River | OH | Coal | Muskingum River | 177,132,583 | 128.2 | 31,626 |
| Northeastern | OK | Gas/coal | Oologah Res. | 12,004,076 | 8.7 | 392 |
| Oklaunion | TX | Coal | Lake Diversion | 4,598,970 | 3.3 | 583 |
| Picway | OH | Coal | Scioto River | | | |
| Pirkey | TX | Lignite | Brandy Branch Res. | 563,196,328 | 407.6 | 32,462 |
| Riverside | OK | Gas | Arkansas River | 1,983,299 | 1.4 | 7,392 |
| Rockport | IN | Coal | Ohio River | 29,407,715 | 21.3 | 601 |
| Southwestern | OK | Gas | Ft. Bobb Res. | 1,960,080 | 1.4 | 1,601 |
| Sporn | WV | Coal | Ohio River | 163,716,772 | 118.5 | 72,901 |
| Tanners Creek | IN | Coal | Ohio River | 287,517,788 | 208.1 | 71,684 |
| Tulsa | OK | Gas | Arkansas River | 2,128,817 | 1.5 | 2,515 |
| Turk | AR | Coal | Little River | 6,215,677 | 4.5 | 508 |
| Waterford | OH | Gas | Muskingum River | 6,019,900 | 4.4 | 259 |
| Weleetka | OK | Diesel | Ground water | | | |
| Welsh | TX | Coal | Welsh Res. | 1,344,899,392 | 973.4 | 57,951 |
| Wilkes | TX | Gas/oil | Johnson Creek Res. | 414,798,505 | 300.2 | 165,096 |
| * Ground water use was not measured. | | | | Totals: | 8,557,960,649 | 6194 |

Water used for Processing, Cooling and Consumption in Thermal and Nuclear Power Plants, including use of Water in Ash Handling:

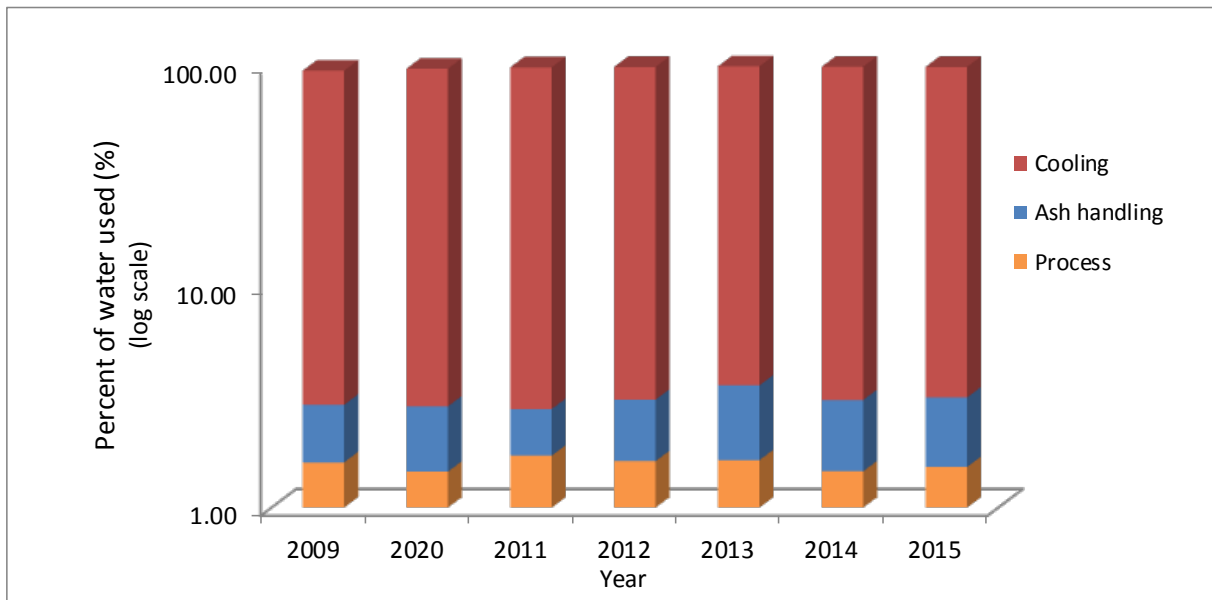
Water is critical to the operation of most power generating facilities, particularly steam electric facilities. Besides cooling, water is used for bottom ash and fly ash transport, cleaning, low volume waste transport, and in the boilers themselves (Figure 2). For example, in a typical fossil fuel-fired facility, fuel, such as coal, is conveyed into a boiler, where it is burned to generate heat. That heat is used in the boiler to generate steam. The steam leaves the boiler and enters a turbine generator, where it drives turbine blades. After leaving the turbine, the steam enters a condenser, where it is cooled by water flowing through the condenser tubes. The condensed water then returns to the boiler.

A constant flow of cooling water is required to cool the condenser. Once-through or recirculating cooling water systems are used. In a once-through system, the cooling water is withdrawn from a source of water, such as a river or lake, flows through the condenser, and is returned back to the source water. Almost no water is lost to evaporation or drift in such systems (less than 4%, NETL 2010), though a large amount of water is withdrawn to cool the condensers. In a recirculation system, the warmed cooling water is cooled in cooling towers or ponds, and is recirculated to the condenser. In a recirculating system, a small amount of water must be continuously discharged to control the buildup of solids. Make-up water is added to replace this water, as well as, water lost through evaporation.

Two types of ash are produced during the combustion of coal: bottom ash and fly ash. After collection, the fly ash and bottom ash may be managed separately or together in landfills or in wet surface impoundments. If managed in surface impoundments, water is used to sluice the ash to these ponds.

Process water use at a typical fossil-fueled facility also includes water used for emission control systems, such as in the flue gas desulfurization (FGD) process (wet scrubbers), and maintenance cleaning.

Figure 2 - Water used for cooling, ash handling and processing at AEP steam electric plants



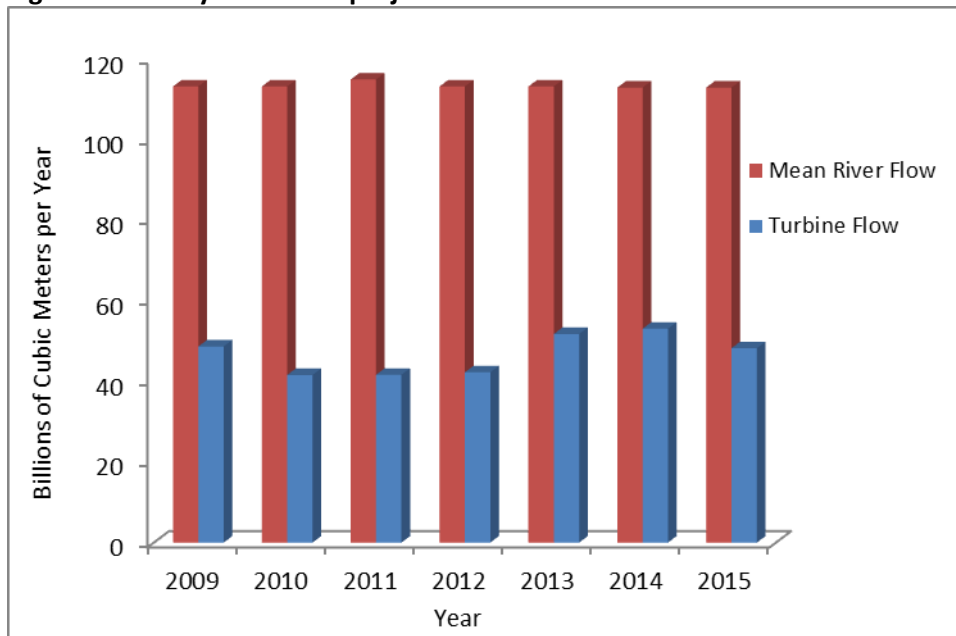
Hydroelectric Facilities

AEP operates 17 hydroelectric projects in Indiana, Ohio, Michigan, Virginia, and West Virginia. Under licenses granted by the Federal Energy Regulatory Commission (FERC), these projects, with the exception of Smith Mountain Lake, which is a pumped storage facility, are operated as “run of river.” This means that the flow of water exiting the project must equal the flow of water entering the project. On average, less than half of the mean annual river flow passes through these projects every year (Figure 3). This difference is due to the fact that at times, only a portion of the river flow goes through the hydroelectric turbines. The remaining water flows over the dam spillways or through lock chambers on navigable rivers.

Source Information. *Steam electric plants* – water balance diagrams are used to determine the percentage of water used for cooling, ash handling, etc. These percentages are then applied to water withdrawal information from G4-EN8 to estimate the actual amount of water used for various plant processes. *Hydro projects* – AEP Hydro Operations Data.

NETL. 2010. *Water Vulnerabilities for Existing Coal-Fired Power Plants.* National Energy Technology Laboratory. DOE/NETL-2010/1429. August 2010.

Figure 3 - AEP hydroelectric project water use



Appendix 9: G4-EN9 - Water sources significantly affected by withdrawal of water

The withdrawal of water from an ecosystem can alter its ability to support important biological and chemical functions. Such changes can affect the quality of the water or the aquatic habitat and have subsequent environmental, quality of life, or economic consequences. Significant water withdrawals are those considered to have an effect on water resources and meet one or more of the following characteristics:

1. Account for an average of 5 percent or more of the mean annual flow of a given water body;
2. are from water bodies that are recognized by professionals to be particularly sensitive due to their relative size, function, or status as a rare, threatened, or endangered system or due to their support of a particular endangered species of plant or animal; or
3. are from a nationally or internationally proclaimed conservation area, regardless of the rate of withdrawal.

Some water withdrawals at AEP facilities meet one or more of the above criteria and are considered to be significant (Tables 3 & 4). For example, during 2015, the Glen Lyn and Muskingum River Plants withdrew more than 5 percent of the mean annual flow from their source water bodies. Eleven facilities withdrew water during 2015 from water bodies that have documented populations of threatened or endangered fish or shellfish, notably, freshwater mussels.

The remaining category of significant water withdrawals are those made by facilities located on water bodies that are designated as salmonid or Outstanding State Resource Waters (OSRW). These include the Berrien Springs and Buchanan hydroelectric facilities (stocked salmonid streams) and the Cook Nuclear Plant (OSRW) (Tables 3 & 4).

Table 3 - Significant 2015 water withdrawals by AEP steam electric facilities

| Facility | Type | Water Sources | Reason for Significant Water Withdrawal Designation |
|-----------------|---------|-----------------|--|
| Clinch River | Coal | Clinch River | River reaches adjacent to the plant are listed as federally designated critical habitat for federally endangered mussels and federally threatened fish, slender chub and yellowfin madtom. |
| Conesville | Coal | Muskingum River | Superior High Quality Water designation by Ohio due to high biodiversity and presence of numerous threatened and endangered mussels. |
| Cook | Nuclear | Lake Michigan | Outstanding State Resource Water |
| Dresden | Gas | Muskingum River | Fresh dead shell of Snuff box mussel (federally threatened). |
| Glen Lyn | Coal | New River | ≥5% of mean flow; Green floater mussel (federally threatened) and recently state-listed pistolgrip mussel (state threatened) are found in New River drainage. |
| Kanawha River | Coal | Kanawha River | Possible threatened or endangered freshwater mussels. |
| Muskingum River | Coal | Muskingum River | ≥5% of mean flow; Superior High Quality Water designation by Ohio due to high biodiversity and presence of numerous threatened and endangered mussels (threehorn wartyback, Ohio pigtoe, fawnsfoot). |

Table 4 - Significant 2015 water withdrawals by AEP hydroelectric facilities

| | | | |
|-----------------|----------------------|------------------|--|
| Berrien Springs | Hydro | St. Joseph River | Salmonid stream |
| Buchanan | Hydro | St. Joseph River | Salmonid stream |
| Byllesby/Buck | Hydro | New River | Green floater mussel (federally threatened) and recently state listed pistolgrip mussel (state threatened) found in New River drainage. |
| Claytor | Hydro | New River | Green floater mussel (federally threatened) and recently state listed pistolgrip mussel (state threatened) found in New River drainage; Fringed mountain snail (federally endangered) historically found in the near vicinity of the Claytor Project boundary. |
| Leesville | Hydro | Roanoke River | Roanoke logperch (federally endangered fish) found in the Roanoke River drainage; the Pigg River has a relatively good population of Roanoke logperch and the river's confluence is in Leesville Lake, between Leesville and Smith Mountain Dams. |
| Niagara | Hydro | Roanoke River | Roanoke logperch (federally endangered fish) found in the Roanoke River drainage. |
| Smith Mountain | Hydro-Pumped Storage | Roanoke River | Roanoke logperch (federally endangered fish) found in the Roanoke River drainage; the Pigg River has a relatively good population of Roanoke logperch and the river's confluence is in Leesville Lake, between Leesville and Smith Mountain Dams. |

Source Information - State water quality standard water use designations; federal and state threatened and endangered species lists; USGS river flow data. NPDES permit fact sheets are also used to document stream flows.

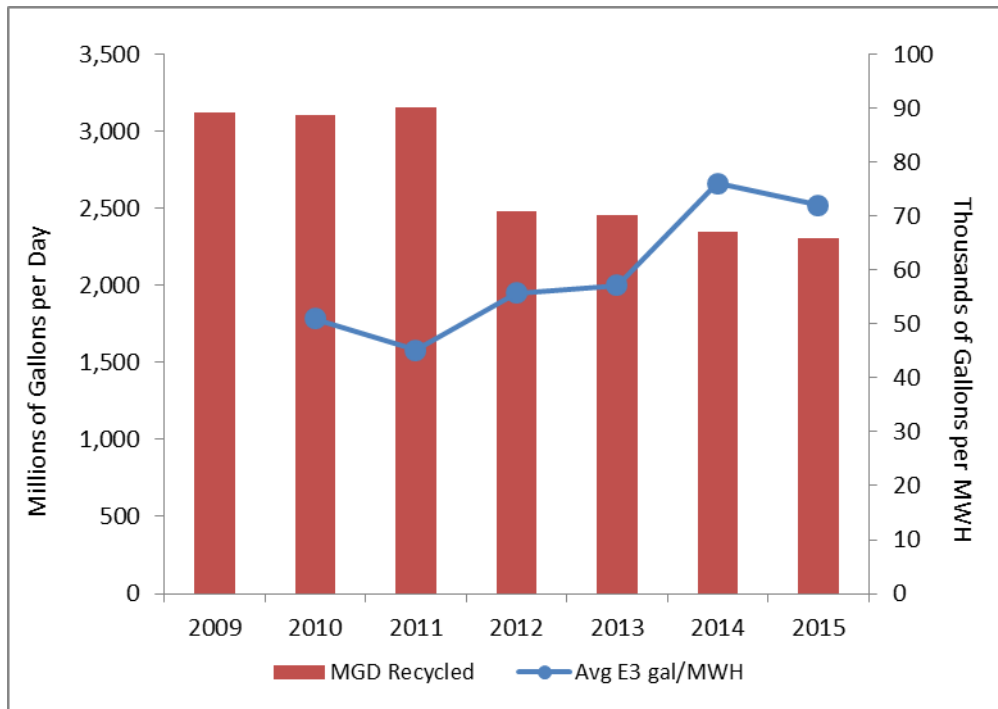
Appendix 10: G4-EN10 - Percentage and total volume of water recycled and reused

A large amount of the water withdrawn for use at power generating facilities is recycled or reused (Figure 4), such as water that is used for cooling at facilities that have closed-cycle cooling. While these systems are not entirely “closed,” as some water is lost due to evaporation in the cooling towers, they do withdraw significantly less water than once-through or open cooling systems.

Water is also recycled at many of the western plants that are on cooling water reservoirs (Comanche, Flint Creek, Knox Lee, Lieberman, Lone Star, Pirkey, Welsh and Wilkes). These reservoirs were specifically built in order to be both the source and receiving water body for the cooling water used at these plants. Assuming negligible loss of water due to evaporation, these facilities “recycle” nearly 100% of the water that they withdraw. Since the cooling lakes are typically large, open bodies of water, they also provide public fishing and recreational boating.

Water used for other non-cooling purposes is also recycled. For example, water used for bottom ash transport, pyrites transport, and other processes is directed to waste water ponds for treatment. After treatment, this water is directed to reclaim ponds from which a significant portion is recycled and used again.

Figure 4 - Amount of water recycled and water use efficiency at AEP steam electric plants



Source Information - AEP water balance data was used to determine percentage of water reused/recycled at each facility. Percentages were then applied to water withdrawal data provided under EN8. It was assumed that plants with cooling reservoirs (Comanche, Flint Creek, Know Lee, Lieberman, Lone Star, Pirkey and Welsh) recycled nearly 100% of the water withdrawn from the reservoirs.

Appendix 11: G4-DMA - Biodiversity - Approaches for vegetation management along transmission corridors; assessment of impacts, mitigation measures, and monitoring at new and existing sites.

Of AEP’s land holdings, roughly 117,518 acres are adjacent to protected areas or areas of high biodiversity, such as wetlands, national parks or areas that support threatened or endangered species (Table 5). The company also maintains at least 73 miles of transmission and distribution lines that cross national forest lands. As a result, AEP has the opportunity to significantly impact, as well as to protect and conserve, biodiversity.

Many biodiversity impacts are clearly evident. Construction activity, such as clearing vegetation and moving earth to build new facilities, totally removes or drastically decreases onsite biodiversity. Siting transmission line corridors can also affect biodiversity, through habitat fragmentation and alteration. The construction of power plants, pollution control equipment and associated landfills results in the loss of wetland and riparian habitat. The installation of hydroelectric generation can alter stream and wetland areas through inundation and flow alterations, can block the movement of fish, such as Chinook salmon and steelhead trout, and can change the quality of the water. Fish passing over or through hydroelectric projects can be injured by impacts on turbine blades, by rapid pressure changes, or by abrasion on rough structures. Transmission lines and related structures can create collision hazards for birds and the transmission corridors themselves fragment the habitat, preventing the movement of animals from one site to another. Wind turbines can also create collision hazards for birds and bats.

Management of biodiversity includes those activities that are done to maintain or improve the diversity of the biological communities or species on a property. Examples include removing trees to protect endangered flowers, stocking fish to maintain certain species, controlling exotic animal introductions or conducting controlled burns on prairie lands. Special management areas may need to be established to meet the habitat requirements of a sensitive species. Oftentimes, more practical applications of property management, such as fencing and visitor control, must be implemented. Natural areas are expected to maintain their biodiversity for many years and the long-term expenses of management can easily exceed the costs of establishing the areas in the first place.

AEP strives to minimize ecological impacts and, in general, approaches biodiversity management by protecting it, restoring it, or enhancing it. AEP restores or mitigates, according to regulatory requirements, any wetland or riparian habitats that must be replaced through compensatory mitigation. AEP also works on a voluntary basis with various community groups, conservation organizations and environmental agencies to preserve, restore and enhance existing habitats. Efforts are often made to enhance properties and improve their biodiversity regardless of their current condition. The monitoring of management areas is generally conducted by state and federal resource agencies. AEP biodiversity impacts generally fall into four primary activities: steam electric generation, hydroelectric generation, wind generation and the maintenance of transmission and distribution facilities.

Steam Electric Generation

Before any major construction project begins, AEP will conduct an environmental assessment of proposed construction sites. These assessments consider all the possible impacts that the project could have on the ecological and cultural characteristics of the site. During these assessments, efforts are made to identify unique areas of special biological value or diversity. If these sites are ultimately selected for construction and the areas cannot be avoided, mitigation projects are undertaken to replace the lost areas.

Given that AEP's power plants withdraw large amounts of water, there is a concern with the effects that the plants may have on the resident populations of fish and other organisms. As an example of AEP's concern for the local ecosystems, the company has been the lead organizer, sponsor, and participant of a long-term study of fish populations in the Ohio River. These field studies have provided a 42-year database demonstrating a lack of significant impacts from power plants and improvements to the overall fish community. Several clean-water fish species have recovered over the years, while pollution-tolerant species have declined. This is in response to the improved water quality of the river.

Hydroelectric Generation

AEP makes every effort to operate its hydroelectric projects in an environmentally benign manner. All projects must be relicensed with the FERC on a periodic basis and during the relicensing process, all potential environmental impacts are considered. If mitigation is necessary, such as a fish stocking program or the cessation of operation, it is incorporated into the operation of the particular project. For example, the alteration of river and stream flow regimes as a result of project operation can make otherwise suitable riverine habitat unfit for aquatic invertebrates, fish, amphibians, and other riparian-dependent species. However, dam operation restrictions are put in place at AEP hydroelectric facilities, which require a facility to operate as run-of-river so that the volume of water leaving a reservoir equals the volume of water entering the reservoir. Stream flow alterations, therefore, become a function of natural phenomenon, such as heavy rains or periods of drought.

Migrating fish may be prevented from moving upstream if their passage is blocked at a hydroelectric project. This could have a significant effect on anadromous fish populations, such as chinook salmon or steelhead trout, which are stocked in the St. Joseph River by the Indiana Department of Natural Resources (IDNR) upstream and downstream of the AEP Twin Branch hydroelectric facility. Below this facility, AEP operates the Berrien Springs, and Buchanan hydroelectric projects, at which, fish ladders are maintained to facilitate the upstream passage of fish. In addition, the turbines at the Buchanan project are shut down for two weeks during the salmonid spawning period to allow out-migrating chinook salmon and steelhead trout smolts, which have been stocked by the IDNR, to pass over the dam without harm.

While hydroelectric operation is often associated with adverse environmental impacts, environmental benefits can be realized due to the formation of an aquatic ecosystem in place of a terrestrial ecosystem. Dam construction and the development of reservoirs can increase public access to otherwise remote habitats. There will typically be an increase in fishing, motorboat use and other similar recreation activities. AEP has installed fishing platforms and has improved boat access at many St. Joseph River and other hydroelectric project locations.

Wind Generation

The AEP wind farms were some of the earliest projects that took [avian activity](#) and post-construction impacts into consideration during site selection. The newest wind turbines, because of their larger size, increased visibility, and site planning have considerably reduced avian collision risk. AEP also installed bird flight diverters, at the time of construction, on the transmission lines serving two new wind farms in the coastal plains of Kenedy County, Texas, to reduce the potential for bird collisions with the line.

Transmission Facilities

AEP follows all appropriate federal, state and local regulations when siting new transmission lines. When the location and routes of new transmission facilities are considered, a special effort is made to avoid potentially sensitive areas. When these areas cannot be avoided, AEP strives to minimize the ecological impacts. Typically, comprehensive data collection and mapping is completed including stakeholder input from the public, and federal, state and local officials and agencies. Feasible mitigations or avoidance measures are developed to address agency concerns. After intensive analysis of collected data, a preferred route is selected that reasonably minimizes adverse impact on environmental resources (visual, natural and cultural) and is consistent with the project siting criteria.

Increasingly, endangered or threatened species are of growing concern nationally. In March 2014, AEP was

among 32 private companies and five states that committed to enroll more than 3.6 million acres in the [Lesser Prairie-Chicken Range-Wide Conservation Plan](#). Working with organizations such as the Western Association of Fish & Wildlife Agencies – which is overseeing this plan – helps us understand the issues, support habitat preservation and take appropriate actions to mitigate our impacts. As we seek to build new transmission facilities, we are mindful of potential environmental and ecological impacts we might have in our service territory.

In Eastern Oklahoma and parts of Arkansas and Texas, AEP has taken steps to protect the American Burying Beetle (ABB) when building projects in its range. The beetle was listed as an endangered species in 1989 and any disturbance of its habitat must be offset. When the beetle is found in areas where a proposed transmission route is being considered, construction activities (including clearing activities) are restricted and the U.S. Fish & Wildlife Service must be consulted. AEP Transmission is developing a long-term habitat conservation plan for the beetle.

Source Information - AEP Corp of Engineer 404 compliance programs (wetland mitigations); AEP EPRI Ohio River Ecological Research Program reports; FERC hydro relicensing studies; WERS staff records; AEP Real Estate and Asset Management Forest Management Program; updated T&D information

Appendix 12: G4-EN11 - Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.

AEP owns or manages the land around its power generating and transmission facilities. Systemwide, AEP owns in fee, approximately 325,000 acres. This includes power plant sites, office buildings, substations, transmission and distribution lines, as well as coal fields yet to be mined, lands that have been mined, residential structures, river access and various other sites, but excludes mineral-only ownership (coal, coal bed methane, oil and natural gas).

Land owned near the power plants directly supports the generation of electricity, serves as a buffer to these operations, and is often leased for agriculture. AEP also operates electric transmission and distribution lines throughout its service territories in Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, West Virginia, and Virginia. Of AEP's nearly 40,000-mile transmission network, approximately 1,200 miles, or less than 3 percent, traverse federal or state lands. The majority of AEP's network was constructed prior to existing federal, state and local environmental laws during the early to mid- twentieth century. Today, avoiding protected lands and areas of biodiversity, while also avoiding visual and cultural resources, is of great importance during new transmission line siting. While many of the properties through which these lines do cross have no special designation, some of them are protected for their ecological value, including national forests maintained by the U.S. Forest Service.

Some of the company properties are located adjacent to protected areas or areas of high biodiversity value. These areas are designed, regulated or managed to achieve specific conservation objectives, are recognized for important biodiversity features, are a priority for conservation, or have been identified as areas of high biodiversity value. High biodiversity areas include national parks and forests and habitat for federal and state endangered species (Table 5).

Table 5 - Land owned, leased, managed in, adjacent to, or containing, protected areas and areas of high biodiversity

| Property owned, leased or managed | Property Acreage | Adjacent Property Biodiversity Descriptions | Potential Impacts |
|--|------------------|---|---|
| Steam Electric Projects | 44,369 | Unique forest, prairie and avian habitats; rare plants, fish and freshwater mussels; federally designated critical habitats | Entrainment, impingement, thermal discharges; avian impacts; habitat fragmentation and alteration |
| Hydroelectric Projects (reservoir acreage) | 25,402 | Unique wetland and avian habitats; rare fish, freshwater mussels, invertebrates and unique plant species | Flow alteration, land inundation, disruption of fish passage, turbine mortality |
| Transmission lines | ~1200 miles | Federally designated critical habitat and National wildlife refuges; other federal or state lands | Habitat fragmentation, avian impacts |
| Wind Farms | 10,830 | Fed designated critical habitat | Avian and bat impacts |
| Forests/Tree Plantations | 60,000 | Preserve for exotic rare and endangered species | No impacts |
| River Operations | 1,661 | Conservation area for state-listed tree, fw mussels | No impacts |
| Other | 658 | State Wildlife Area; mixed forest, brushlands, and wetlands | No impacts |

Source Information - AEP Hydro Operations data; AEP Real Estate Asset Management data; ArcGIS and Esri mapping tools, USGS PAD-US maps, IUCN-USGS "protected areas" definitions; WERS staff records (power plant sites, T&D line routes); National Forest maps; federal threatened and endangered species lists and habitat listings.

Appendix 13: G4-EN12 – Significant impacts of activities, products and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas

Impacts of Power Plant Construction

Construction of pollution control equipment and associated landfills has resulted in the loss of wetland and riparian areas near several power plant sites. However, these losses have been permitted under the Corps of Engineers' 404 program and are mitigated by the company, often on a two-to-one, three-to-one, or higher basis.

Hydroelectric Generation

AEP operates six hydroelectric projects that are adjacent to or contain areas of high biodiversity (Table 5). The potential impacts of these facilities includes alteration of stream and wetland areas by inundation, fluctuation of river flows and reservoir levels, blockage of upstream and downstream fish movement, and turbine-induced mortality. The alteration of river and stream flow regimes as a result of dam operation can make otherwise suitable riverine habitat unfit for aquatic invertebrates, fish, amphibians, and other riparian-dependent species. Fluctuating stream flows and water levels can also reduce the area suitable for fish spawning and can subject fish eggs to dehydration.

The blockage of both upstream and downstream fish movement by dams, diversion structures, turbines, spillways, and waterways can affect fish populations. Organisms passing over dam spillways or through hydroelectric turbines can be injured by strikes or impacts with solid objects, rapid pressure changes, abrasion with rough structures and the shearing effects of turbulent water. In addition, fish that pass through trash racks and into turbines become susceptible to turbine-induced mortality.

Migrating fish may be prevented from moving upstream if their passage is blocked by the dams. AEP operates the Niagara and Smith Mountain hydroelectric projects on the Roanoke River, which contains the Roanoke

Logperch, a federally endangered fish species. The dams restrict the movements of these fish, potentially isolating the populations and preventing genetic mixing.

While there are many potential hydroelectric environmental impacts, all of these are assessed and if necessary, mitigated, during the FERC Licensing process. Every AEP hydroelectric project has successfully completed this process.

Impacts of Wind Generation

AEP operates two wind facilities, Trent Mesa near Sweetwater, Texas, and Desert Sky near Iraan, Texas, that are near federally designated critical habitat for certain bird species. These facilities have the potential to impact large raptors, such as golden eagles, and smaller birds, while migrating in large flocks. To avoid avian-bird interactions, turbine design and wind farm siting have taken avian issues into consideration very early in the process. In recent years, bats have come to the wind industry's attention and studies to grasp the dimension of this issue continue. Because of deaths of endangered bats, some wind farms must curtail operations when bats are active.

Cooling Water Intake (Impingement and Entrainment) Impacts on Biodiversity

At AEP's generating facilities that utilize a once-through cooling water heat transfer system, large quantities of water are withdrawn from large rivers, man-made impoundments, or (in the case of D.C. Cook Plant), from adjacent Lake Michigan. These facilities are typically older (built prior to 1970). The potential impacts on local biodiversity are impingement (fish irreversibly contacted upon intake screens) and entrainment (the passage of small fish and fish eggs through the condenser cooling system) (Tables 3 & 4). Section 316(b) of the Clean Water Act requires that the placement and operation of cooling water intake systems meet Best Technology Available for minimizing adverse environmental impact (often interpreted to be synonymous with the most cost-effective means of minimizing fish entrainment and impingement).

AEP has completed studies of impingement rates at facilities located on the Ohio River. The results indicate that: 1) the vast majority of fish impinged (numbers of fish) represent very few species of abundant forage fish and 2) no fish species has been known to experience a drastic population reduction that can be attributed to impingement and/or entrainment effects. AEP has monitored the fish populations near several facilities utilizing once-through cooling for many decades. These studies indicate that the year-to-year fluctuation in population size for key species has no correlation to the rates of impingement and/or entrainment.

As an outcome of the final 316(b) and other rulemakings, AEP has closed several once-through cooled facilities and may be required to retrofit improved fish protection equipment at the remaining once-through cooled facilities. Such changes will lower the rates of impingement and/or entrainment of vulnerable fish species.

Source Information - FERC hydro relicensing studies; AEP Corp of Engineer 404 compliance programs (wetland mitigations); AEP Avian Protection Program. Cooling water intake impacts determined from plant 316(b) studies.

Appendix 14: G4-EN13 – Habitats protected or restored

AEP works in partnership with various community groups, conservation organizations, and environmental agencies to preserve, restore, and enhance existing habitats. This work encompasses many activities, including the reforestation and reclamation of former mine sites, the restoration of impacted wetlands and river corridors, the protection of unique habitats, the enhancement of wildlife areas and reservoirs, and the

management of tree plantations to encourage wildlife. New projects for 2015 included the following:

- As part of the Big Sandy fly ash pond closure, 124.1 acres of forested habitat required tree clearing. To mitigate for cumulative effects to the Indiana bat and northern long eared bat, \$196,607.50 was contributed to the Indiana Bat Conservation Fund.
- As part of a New Source Review consent decree, AEP funded the purchase of 4.76 acres of land through The Nature Conservancy at a total cost of \$16,168.05. This purchase contributed to the continued progress of the Sunshine Corridor and Edge of Appalachia conservation projects.

Wetland and Stream Mitigation Habitats

AEP has set aside land to create mitigation wetlands. Mitigation wetlands are those that have been set aside to replace those that were unavoidably lost due to the construction of AEP facilities. These mitigation projects have been approved by the Corps of Engineers and/or state environmental agencies. Over the past several years, AEP has established over 948 acres for mitigation purposes, mostly at steam electric plants and hydroelectric projects (Table 6).

Conservation Areas

Over 55,000 acres have been set aside as part of AEP's corporate stewardship program to protect unique habitats (Table 6). These include areas such as the Nipissing Dune Trail at the Cook Energy Information Center, a prairie at the Darby Plant, a 14 acre nature preserve to protect the Kentucky silver bell, a rare tree species near the AEP Cook Coal Terminal in southern Illinois, and the eagle watch pavilion at the Flint Creek Plant. Other examples include work with *The Nature Conservancy* in the 1990's to help develop a 37,000 acre Tall Grass Prairie in Oklahoma and work with the U.S. Fish & Wildlife Service to acquire the Bahia Grande property in Texas to re-flood and restore an 11,000-acre wetland.

Wildlife Management Areas

Properties have been set aside as wildlife management areas at facilities such as the Gavin and Mountaineer Plants. Donations have also been made to state wildlife management areas in Ohio and Kentucky to allow them to expand their land holdings (Table 4).

Enhanced Reservoirs

AEP has enhanced nearly 29,000 acres of company-managed reservoirs (Table 6). In compliance with the requirements of FERC license renewals, wildlife management plans have been negotiated at many hydroelectric projects, which require the installation and monitoring of duck boxes and nesting structures within the pools above each dam. These activities support ducks, bluebirds, purple martins, kestrels, owls, ospreys and bald eagles. Work is also done to improve the sport fishing opportunities in the reservoirs upstream of the projects. Efforts include the construction of bush pile fish attractors in the river pools and fish stocking.

Table 6 - Habitat Protected or Restored

| Habitat Restored, Protected or Enhanced | Reason for Protection/Restoration | Habitat Acreage | Habitat Designation/Use | Habitat characteristics |
|--|---|-----------------|---|---|
| Wetlands and Streams (mitigation habitats) | Corp. permits, FERC requirements | >947 | wetland/stream mitigation | wetlands, shorelines, forests, streams |
| Conservation Areas | Corporate stewardship, NSR Consent Decree, National partnerships, | >55,623 | conservation and recreation areas | forests, prairies, grass lands, marine wetlands and forests, lake dunes, stream and river corridors, bird habitat |
| Conservation Streams | Corporate stewardship, NSR Consent Decree | 23 miles | conservation area | warmwater fishery, stream headwaters |
| Wildlife Management Areas | Corporate stewardship | 43,266 | hunting/fishing | wildlife/forest habitat |
| Enhanced Reservoirs | FERC requirement, Corporate stewardship | >28,952 | enhanced reservoir, recreation | duck boxes, nesting structures, salmon fishery, vegetation control, fish habitat |
| State Lands | NSR Consent Decree | 17,522 | state lands | unique barrens/limestone glade complex, riparian habitat, rare fish, plant and mussel species |
| Reclaimed Forests | Reforestation/mine reclamation | 95,594 | tree plantation, recreation | wildlife/forest habitat |
| Fed designated critical habitat | USFWS requirement, NSR Consent Decree, National partnership | >30,437 | Fed designated critical habitat, National wildlife refuge | avian flyways, unique boreal ecosystem, bottomland hardwood forests, wetlands |

State Lands and Federally Designated Critical Habitat

AEP participates in partnerships with various organizations to promote the restoration of wildlife habitat. *The Catahoula Project* in Louisiana is an example of such a partnership. For this work, the Conservation Fund, the U.S. Department of the Interior's Fish & Wildlife Service (USFWS) and AEP joined together to acquire, protect and restore a bottomland hardwood forest on 18,372 acres near Catahoula Lake in east central Louisiana, a major haven for migratory birds in the Mississippi delta.

Reclaimed Forests

Reforestation/Mine Reclamation - AEP's commitment to trees and forest preservation is strong and still growing. Since the 1940s, AEP has planted tens of million trees in the United States on land owned by the company or under agreement with other owners. This total includes 15 million trees planted on 20,000 acres of company land between 1996 and 2000 as part of the Department of Energy's Climate Challenge program. These trees will create a new "carbon sink," which is intended to capture or "sequester" carbon dioxide, a greenhouse gas, thereby reducing the potential for global climate change.

A significant property that has benefitted from this work is AEP's *ReCreation Land*. This area encompasses approximately 59,000 acres of land in eastern Ohio that was mined and reclaimed by Ohio Power's Central Ohio Coal Company, an AEP subsidiary. The land now has more than 350 lakes and ponds and nearly 380 campsites that millions of people have enjoyed since 1961. Recently, AEP partnered with the *Electric Power Research Institute* to evaluate the ecosystem services provided by the site and the possible impacts that shale gas fracking

could have on these resources. Ecosystem services are resources and benefits, such as timber, fish, water, waste decomposition, pollination or CO₂ sequestration, that are supplied by ecosystems and benefit mankind. Results of the study to date have indicated no long-lasting impacts.

AEP also supports the establishment of tree plantations by providing and planting trees on company, government-owned, not-for-profit, and private properties. Various agreements are in place to ensure the receipt of carbon sequestration credits. The government-owned and not-for-profit properties are "protected, restored and managed," while the private properties are considered to be "restored." Almost 26,000 acres of forest are managed under carbon credit agreements, while an additional 446 acres are managed solely for forest growth.

Forest Management - AEP domestically has approximately 160,000 acres of forestland under Forest Management. The primary focus of this program is to maintain the long-term productivity of existing forest assets by following a management philosophy of sustainable forestry on property that will remain in forest cover for the foreseeable future. This will be accomplished by providing guidance, direction, coordination and oversight of all company forest management activities.

The forest resource is maintained in a steady state by balancing forest growth with timber harvests. Following this philosophy is necessary for the credible reporting of active forest management activities under the Climate Challenge and under Section 1605(b) of the 1992 Environmental Policy Act. The AEP Forest Management Program emphasizes sound contributions to ecological and wildlife habitat, and its commitment to enhanced recreational use.

American Tree Farm Program - In addition to managing all of AEP's forest ownerships under the long-term sustained yield guidelines, AEP is an active participant in the American Forest Foundation's American Tree Farm Program. This program is a national effort to encourage and recognize excellent forestry on private lands that are committed to sustained production of renewable forest products under a multiple use management approach. Sustainable forestry means managing forests to meet the needs of the present without compromising the ability of future generations to meet their own needs by practicing a land stewardship ethic which integrates the reforestation, managing, growing, nurturing and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat and aesthetics.

All AEP Forest Management Plans address the four elements of the Tree Farm Certification Program; wood, water, wildlife and recreation use opportunities. Since 1983, AEP has had over 120,000 acres of its forestlands certified in the Tree Farm System, and in 2000, AEP was recognized as Tree Farmer of the year in Ohio. The American Tree Farm System is now endorsed by the Program for the Endorsement of Forest Certification schemes (PEFC). PEFC requires the American Tree Farm System follow internationally accepted third-party certification auditing procedures.

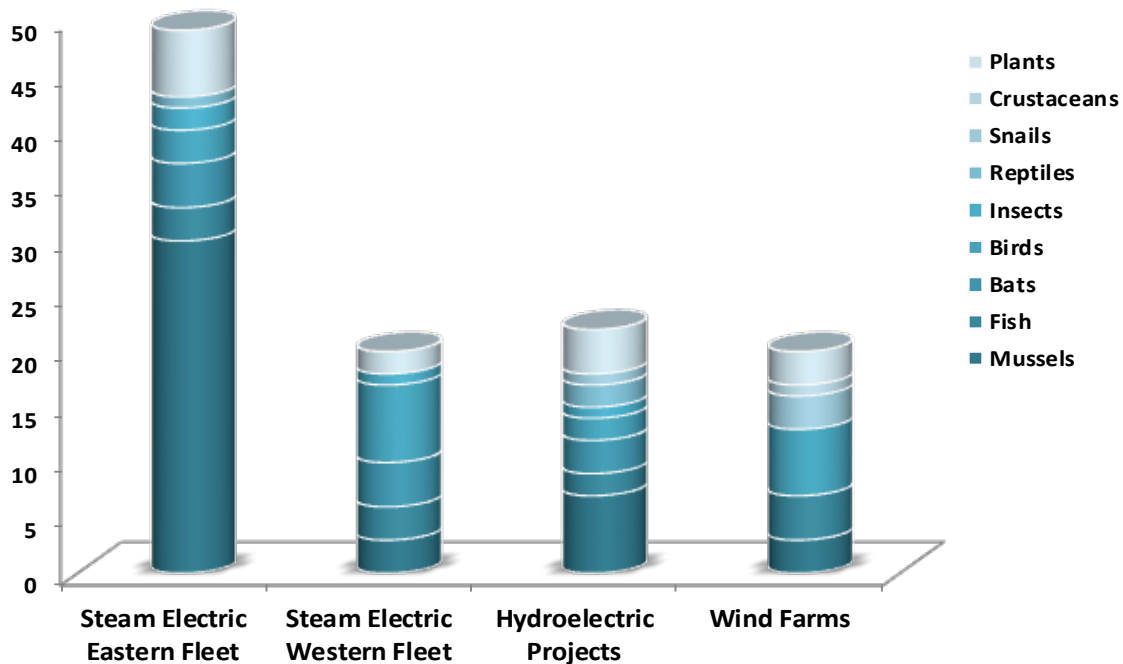
Source Information - AEP ReCreation Land records; AEP report, "Beyond Environmental Compliance," AEP System Environmental Performance reports; WERS staff records; AEP Wildlife Habitat Council Certification records, (all summarized in Appendix 5).

Appendix 15: G4-EN14 - Total number of IUCN red list species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.

In lieu of the IUCN Red List, AEP has created a list of federally threatened and endangered species that may be present near company generation facilities (Figure 5). The U.S. Fish and Wildlife Service (USFWS) Information, Planning and Conservation, or IPaC system, was used to create a list of species that may be present within one mile of an AEP generation facility (steam, hydro, wind). This process yielded a total of 83 listed species, 36 of which are freshwater mussels, which should be considered in any project planning process.

The eastern steam electric fleet is primarily affected by the potential presence of bats and freshwater mussels, which could affect every facility in the area (Figure 5). The Indiana bat and northern long-eared bat are the major species of concern. The western steam electric fleet could be affected by the potential presence of listed birds, such as the least tern and the piping plover (Figure 5). The hydroelectric facilities, which are located in the Midwest and southeastern portions of the AEP service territory, are primarily affected by the bat species listed above. Like the western fleet, the wind farms, also located in the west, are primarily affected by bird species.

Figure 5. Number of endangered, threatened or candidate species within one mile of AEP facilities.



While several AEP transmission lines transect national forests, the presence of federally threatened and endangered species has not been confirmed in these areas; therefore, no species are listed. Also, although The Wilds facility in Cumberland, Ohio maintains populations of rare and endangered species, due to the unique mission of the facility, which houses non-native species, such as zebras, gazelles, rhinoceroses and camels, those species have not been listed.

Source Information - U.S. Fish and Wildlife Service (USFWS) Information, [Planning and Conservation or IPaC system](#)
Appendix 16: G4-DMA Effluents and Waste

Discharges

American Electric Power steam electric generating facilities discharge billions of cubic meters of process wastewater to surrounding surface waters each year (Table 7). Approximately 96% of these water releases are non-contact cooling waters from steam electric facilities (Figure 2). Once-through cooling systems withdraw water from a nearby water body, pass it through a condenser, and discharge it back into the body of water. Chlorine or other biocides may be added to the water to control biofouling. In closed cooling systems, water that has passed through a condenser is sent to a cooling tower to lower the temperature. As water evaporates, the latent heat required to evaporate the water is transferred from the cooling water to the air, cooling the water (USEPA 2009). Because some of the water evaporates, fresh make-up water is added to the system. In addition, a small amount of water must be periodically discharged to control the buildup of solids. This water is referred to as “cooling tower blowdown” (USEPA 2009).

The next largest wastewater releases are ash handling waters; however, these effluents represent only about two percent of all AEP discharges (Figure 2). The burning of coal or oil in steam electric boilers produces a noncombustible residue known as ash. Heavier particles that collect at the bottom of the boiler are known as bottom ash. Finer particles that are light enough to be transferred in the flue gas are known as fly ash. Fly ash and bottom ash can be transported by wet handling systems that produce slurries of ash, referred to as “sluices,” which are typically transferred to surface impoundments. The ash settles in the impoundments prior to recycling or discharge of the water. Fly ash and bottom ash sluices typically contain heavy metals and inorganic constituents (U.S. EPA 2015).

Other waste streams from AEP facilities include metal cleaning wastes, coal pile runoff, boiler blowdown, FGD chloride purge streams, sump water, turbine seal water, landfill leachate and seepage, and other low volume wastes. Metal cleaning wastes are those resulting from the cleaning of any metal process equipment. Chemicals are often used to remove scale and corrosion from boiler tubes. The major constituents of cleaning wastes are iron, copper, nickel, and zinc. Alkaline reagents are also used to clean air preheaters and to neutralize acidity. These alkaline washes can consist of soda ash, caustic soda, phosphates, and detergent.

Coal pile runoff consists of rainwater that has accumulated on and near coal storage piles. Coal pile runoff is typically acidic and may contain high concentrations of copper, iron, aluminum, nickel, and other constituents present in coal (U.S. EPA 2009). Boiler blowdown is that water which is periodically discharged from boilers to control the build-up of solids. There are many sources of impurities in boiler blowdown, including intake water, internal corrosion of the boiler, and chemicals added to the boiler system (U.S. EPA 2006). Examples of impurities include soluble inorganic salts, calcium, magnesium, iron, copper, chromium, phenol, phosphate, and other chemical species. Other low volume wastes include laboratory and sampling streams, floor drains, cooling tower basin cleaning wastes, and recirculating service water systems (U.S. EPA 2013).

Treatment

The majority of water used at AEP generating facilities is used for cooling purposes, either in once-through or recirculating closed systems. Cooling towers are most frequently used to cool the water in closed systems, however, in both once-through and closed systems, various methods are used to remove biocides and residual oxidants. Typically, biocides are used in low-level applications to treat the biofouling that occurs in the cooling systems. Natural decay may be utilized to remove biocides or dehalogenation systems may be used to comply with NPDES permit limits. In these systems, a reducing agent is added to consume the residual oxidizing biocide. Sulfur dioxide is the most commonly used dehalogenation chemical. Bentonite clay can be added to absorb excess non-oxidizing biocides, which are not removed by sulfur dioxide.

Bottom ash and fly ash ponds are used to treat ash sluice water and are primarily settling basins that allow ash constituents and suspended solids to settle out before the transport water reaches the discharge point or is recycled. Some iron co-precipitation also occurs in these ponds, aiding with the removal of pollutants such as arsenic. The control of pond pH also helps to precipitate out metals, such as copper. In some cases, aeration-mixing or treatment chemicals are used to maximize pond effectiveness.

The operation of a wet FGD system typically results in the generation of a chloride purge stream, which must be treated to manage pH and solids levels. The treatment process is based on three broad principles:

- Removal of the bulk of the suspended solids in a primary clarification step,
- conversion of constituents into solid precipitates, and
- removal of solids remaining after primary clarification, including precipitated solids.

Once treated, this effluent is generally directed to a bottom ash pond for further settling before final discharge to a receiving/source water body.

All AEP facilities that discharge such effluents have National Pollutant Discharge Elimination System (NPDES) permits that have been issued by the appropriate state agencies. These permits govern the discharge of the treated wastewaters and ensure compliance with all applicable water quality standards. The Clean Water Act requires facilities that discharge process wastewaters into receiving waters to control these discharges according to technology-based effluent guidelines and water quality-based effluent limits specified in NPDES permits.

The Steam Electric Effluent Limitation Guidelines (ELGs) specify limits for various pollutants found in power plant waste waters. These limits are based on the available and economically achievable technologies that can be implemented at steam electric facilities. Monitoring is conducted at each AEP facility to ensure that the discharges comply with these limits. However, USEPA recently revised the ELGs, creating new waste water categories and limits [link to EPA regulation](#). Beginning as “soon as possible” after November 1, 2018, but no later than December 31, 2023, electric utilities must cease discharging coal ash transport water. In addition, FGD waste water must be treated to meet new limits for arsenic, mercury, selenium and nitrate-nitrite. AEP is working to install treatment technologies to meet the new limits.

Source Information - USEPA reports: USEPA. 2006. *Interim Detailed Study Report for the Steam Electric Power Generating Point Source Category*. EPA-821-R-06-015. Washington, D.C. (November). USEPA. 2009. *Steam Electric Power Generating Point Source Category: Final Detailed Study Report*. EPA-821-R-09-008. Washington, D.C. (October) [link](#) USEPA. 2013. *Technical Development Document for the Proposed Effluent Guidelines and Standards for the Steam Electric Point Source Category*. EPA-821-R-13-002 Washington D.C. (April). USEPA. 2015. *Technical Development Document for the Effluent Limitations Guidelines for the Steam Electric Power Generating Point Source Category*. EPA-821-R-15-007. Washington, D.C. (September) [link](#) AEP water balance diagrams were used to determine the percentage of water discharged from various waste streams. These percentages are then applied to water withdrawal information from EN8 to estimate actual amount of water discharged.

Table 7 - AEP 2015 power plant water discharges*

| Facility | Effluent Descriptions | Water Discharge 2015 (m3) | MGD | Receiving streams |
|--------------------|--|----------------------------------|------------|---------------------------------|
| Amos | Ash handling, FGD waste water, low volume wastes | 7,347,542 | 5.32 | Kanawha River and tributary |
| Arsenal Hill/Stall | Cooling water, low volume wastes | 2,210,828 | 1.60 | 12 Mile Bayou/Red River |
| Big Sandy | Ash handling, low volume wastes | 3,275,465 | 2.37 | Blain Creek |
| Cardinal | Cooling water, ash handling, FGD waste water, low volume wastes | 1,146,099,792 | 829.50 | Ohio River and tributary |
| Ceredo | No discharge | 0 | | --- |
| Clinch River | Ash handling, coal pile runoff, low volume wastes | 5,604,046 | 4.06 | Clinch River and tributary |
| Comanche | Cooling water | 2,682,856 | 1.94 | Comanche Reservoir/Nine Mile Ck |
| Conesville | Cooling water, ash handling, coal pile runoff, low volume wastes | 41,507,695 | 30.04 | Muskingum River |
| Cook | Cooling water, low volume wastes | 2,896,849,499 | 2096.62 | Lake Michigan |
| Darby | No discharge | 0 | | --- |
| Dresden | Process water | 816,983 | 0.59 | Muskingum River |
| Flint Creek | Cooling water | 501,662,634 | 363.08 | SWEPCO Lake |
| Gavin | Ash handling, FGD leachate, low volume wastes | 21,154,565 | 15.31 | Ohio River and tributaries |
| Glen Lyn | Cooling water, ash handling, coal pile runoff, low volume wastes | 58,890,435 | 42.62 | New River and tributaries |
| Greenville | No discharge | 0 | | --- |
| Kammer | Cooling water, ash handling, low volume wastes | 84,679,571 | 61.29 | Ohio River |
| Kanawha River | Cooling water, ash handling, low volume wastes | 122,946,816 | 88.98 | Kanawha River |
| Knox Lee | Cooling water, low volume wastes | 367,986,398 | 266.33 | Cherokee Reservoir |
| Lawrenceburg | Cooling water, low volume wastes | 2,548,570 | 1.84 | Tanners Creek |
| Lieberman | Cooling water, low volume wastes | 39,735,748 | 28.76 | Caddo Lake |
| Lone Star | Cooling water, low volume wastes | 7,451,428 | 5.39 | Ellison Creek Res. |
| Mattison | No discharge | 0 | | --- |
| Mitchell | Ash handling, coal handling, AMD, low volume wastes | 9,843,109 | 7.12 | Ohio River |
| Mone | No discharge | 0 | | --- |
| Mountaineer | Ash handling, FGD waste water, low volume wastes, coal handling | 4,222,193 | 3.06 | Ohio River |
| Muskingum River | Cooling water, ash handling, low volume wastes | 176,508,937 | 127.75 | Muskingum River |
| Northeastern | Cooling water, ash handling, coal pile runoff, low volume wastes | 4,576,554 | 3.31 | Verdigris River |
| Oklunion | Wash water, low volume wastes | 0 | 0.00 | Tributary of Boggy Ck. |
| Picway | Cooling water, ash handling, low volume wastes | 0 | 0.00 | Scioto River |
| Pirkey | Cooling water, ash handling, low volume wastes | 563,196,328 | 407.62 | Brandy Branch Res. |
| Riverside | Cooling water | 1,944,789 | 1.41 | Arkansas River |

| Facility | Effluent Descriptions | Water Discharge 2015 (m3) | MGD | Receiving streams |
|----------------|---|---------------------------|--------------|--------------------|
| Rockport | Ash handling, coal handling, low volume wastes | 10,056,166 | 7.28 | Ohio River |
| Southwestern | Cooling water, low volume wastes | 969,724 | 0.70 | Washita River |
| Sporn | Ash handling, FGD waste water, low volume wastes, coal handling | 163,743,833 | 118.51 | Ohio River |
| Tanners Creek | Cooling water, ash handling, low volume wastes | 287,991,112 | 208.44 | Ohio River |
| Tulsa | Cooling water, low volume wastes | 966,235 | 0.70 | Arkansas River |
| Turk | Cooling water, low volume wastes | 269,271 | 0.19 | Little River |
| Waterford | Cooling water, low volume wastes | 1,153,005 | 0.83 | Muskingum River |
| Weleetka | No discharge | 0 | | --- |
| Welsh | Cooling water, ash handling, low volume wastes | 1,344,899,392 | 973.38 | Welsh Reservoir |
| Wilkes | Cooling water, low volume wastes | 414,798,505 | 300.21 | Johnson Creek Res. |
| Totals: | | 8,298,590,022 | 6,006 | |

* Discharge information based on annual water withdrawal reports and plant water balance.

Appendix 17: G4-EN26 - Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization’s discharges of water and runoff.

While American Electric Power discharges billions of gallons of wastewater per day from its steam-electric facilities, based on design flows, only about 30 percent of this water is released to waters that could be sensitive. Of this, about 70 percent is non-contact cooling water discharged into Lake Michigan by the Cook Nuclear Plant (Table 8). This discharge meets all water quality standards and, though biocides are periodically applied, it is treated and considered to be clean water. However, this discharge is considered to be significant because it is released to Lake Michigan, which is designated as an Outstanding State Resource Water by Indiana and other adjoining states.

Other discharges constitute the remaining flows to receiving streams which are considered to be significant. However, these discharges meet all applicable water quality standards and in many cases, have improved the quality of the receiving stream water. For example, some receiving streams are impacted by acid mine drainage, making them acidic and unable to support aquatic life. The addition of typically alkaline ash transport water improves the condition of these streams, allowing them to support viable aquatic communities.

Other AEP discharges are released to water bodies that support federally-listed threatened and endangered species, in particular, freshwater mussels. While not believed to be harmful, the discharges are listed due to the presence of these species.

Table 8 - Water bodies significantly affected by discharges of water from steam-electric facilities

| Water Body | Facility | Discharge Type | Reason for Significant Discharge Designation |
|-------------------------------------|-------------------|---|--|
| Blockhouse Hollow | Cardinal | Fly ash pond | >5% mean flow (effluent dominated water body). |
| Clinch River | Clinch River | Waste water treatment | Multiple federally endangered mussels within the Clinch River. River reaches adjacent to the plant are listed federally designated critical habitat for these listed mussels. Slender chub (federally threatened) and yellowfin madtom (federally threatened) occur in the Clinch River and river reaches adjacent to plant are federally designated critical habitat for these species. |
| Conners Run | Kammer / Mitchell | Fly Ash Pond | >5% mean flow (effluent dominated water body). |
| Muskingum River | Dresden | Process water | Fresh dead shell of Snuff box mussel (federally threatened). |
| East River ¹ | Glen Lyn | Cooling water, ash transport, coal pile | >5% mean flow (effluent dominated water body); Green floater mussel (federally threatened) and recently state listed pistolgrip mussel (state threatened) found in New River drainage. |
| Ginney Hollow ¹ | Glen Lyn | Cooling water | >5% mean flow (effluent dominated water body); Green floater mussel (federally threatened) and recently state listed pistolgrip mussel (state threatened) found in New River drainage. |
| Honey Creek | Rockport | Landfill runoff | >5% mean flow (effluent dominated water body). |
| Kanawha River | Kanawha River | Cooling water, ash transport water | >5% of mean flow; possible threatened or endangered freshwater mussels. |
| Lake Michigan | Cook | Cooling water | Outstanding State Resource Water |
| Muskingum River | Conesville | Cooling water | >5% of mean flow; Superior High Quality Water designation by Ohio due to high biodiversity and presence of numerous threatened and endangered mussels. |
| Muskingum River | Waterford | Cooling tower blowdown | Presence of threatened and endangered mussels. |
| New River | Glen Lyn | Cooling water, ash transport | >5% of mean flow; Green floater mussel (federally threatened) and recently state listed pistolgrip mussel (state threatened) found in New River drainage. |
| Tanners Creek | Lawrenceburg | Cooling water, low volume waste | >5% mean flow (effluent dominated water body). |
| Turkey Run | Gavin | Landfill leachate | >5% mean flow (effluent dominated water body)?? |
| Unnamed tributary of Ninemile Creek | Comanche | Cooling water | >5% mean flow (effluent dominated water body). |

¹ These streams flow directly into the New River, which supports documented populations of federally threatened mussels. The streams themselves serve mainly as conduits for the discharges and are not known to support rare or endangered aquatic life.

The remaining water bodies receive discharges that make up more than 5 percent of their mean annual flow.

While there is no evidence of harm to such systems, the volume of the discharged water makes the receiving streams vulnerable to water quality changes. One facility in particular, the AEP Muskingum River Plant, discharged heated cooling water to the Muskingum River and had the potential to affect fish populations in the river. The plant has been retired for reasons not related to the thermal discharges.

The NPDES permit for the Muskingum River Plant (MRP) required that specified downstream water temperatures not be exceeded once the cooling water discharged from the plants mixed with the Muskingum River. The temperature limits were needed to protect fish and other aquatic life from the adverse effects of high temperature. Heat from power plant was regarded as a pollutant by state agencies, thus limitations on excessive heat pollution were necessary for environmental protection.

During certain conditions (low river flow and high river and air temperatures), generation had to be carefully controlled to make sure that the total heat loading did not cause an excursion of downstream temperature limits. This required a real-time, continuous feedback of river temperatures downstream of the plant. At MRP, temperature sensors were installed across the river at a distance of one mile from the plant discharge. The data from these sensors were used by plant staff to accurately assess downstream river temperatures and to make adjustments to protect the fish in the river.

Four hydroelectric facilities are listed as significantly affecting water bodies due to the discharge of cooling water and process wastewater to streams that contain federally threatened or endangered fish or freshwater mussels (Table 9). However, the discharges to these streams are very small, being less than one percent of the total flow of water through these facilities and is of no consequence to the aquatic life.

Source Information - State water quality standard water use designations; federal and state threatened and endangered species lists; USGS river flow data.

Table 9. Water bodies significantly affected by discharges of water from hydroelectric facilities

| Water Body | Facility | Discharge Type | Reason for Significant Discharge Designation |
|---------------|----------------|------------------------------|---|
| New River | Claytor | Cooling water, seal water | Green floater mussel (federally threatened) and recently state listed pistolgrip mussel (state threatened) found in New River drainage ; Fringed mountain snail (federally endangered) historically found in the near vicinity of the Claytor Project boundary. |
| Roanoke River | Leesville | Cooling water, seal water | Roanoke logperch (federally endangered fish) found in the Roanoke River drainage; the Pigg River has a relatively good population of Roanoke logperch and the river’s confluence is in Leesville Lake, between Leesville and Smith Mountain Dams. |
| Roanoke River | Niagara | Cooling water, bearing water | Roanoke logperch (federally endangered fish) found in the Roanoke River drainage. |
| Roanoke River | Smith Mountain | Cooling water, seal water | Roanoke logperch (federally endangered fish) found in the Roanoke River drainage; the Pigg River has a relatively good population of Roanoke logperch and the river’s confluence is in Leesville Lake, between Leesville and Smith Mountain Dams. |

Appendix 18: G4-LA1 - Total number and rate of employee turnover by age group, gender and region

Total Hires - 2015

| State | Gender | Active Employees | Total Hires | Hires Under 30 | % of Hire Under 30 | Hires 30-50 | % of Hires 30-50 | Hires Over 50 | % of Hires Over 50 |
|-------|--------|------------------|-------------|----------------|--------------------|-------------|------------------|---------------|--------------------|
| AL | M | 2 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| AL | F | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| AR | M | 307 | 36 | 11 | 30.56 | 22 | 61.11 | 3 | 8.33 |
| AR | F | 29 | 2 | 0 | 0.00 | 1 | 50.00 | 1 | 50.00 |
| CA | M | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| CA | F | 1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| DC | M | 3 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| DC | F | 4 | 1 | 1 | 100.00 | 0 | 0.00 | 0 | 0.00 |
| FL | M | 1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| FL | F | 1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| IL | M | 67 | 6 | 1 | 16.67 | 5 | 83.33 | 0 | 0.00 |
| IL | F | 4 | 1 | 0 | 0.00 | 1 | 100.00 | 0 | 0.00 |
| IN | M | 919 | 72 | 39 | 54.17 | 32 | 44.44 | 1 | 1.39 |
| IN | F | 188 | 7 | 1 | 14.29 | 3 | 42.86 | 3 | 42.86 |
| KS | M | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| KS | F | 1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| KY | M | 857 | 62 | 45 | 72.58 | 13 | 20.97 | 4 | 6.45 |
| KY | F | 94 | 3 | 0 | 0.00 | 2 | 66.67 | 1 | 33.33 |
| LA | M | 1155 | 70 | 44 | 62.86 | 21 | 30.00 | 5 | 7.14 |
| LA | F | 256 | 18 | 6 | 33.33 | 11 | 61.11 | 1 | 5.56 |
| MI | M | 1132 | 66 | 20 | 30.30 | 37 | 56.06 | 9 | 13.64 |
| MI | F | 182 | 18 | 8 | 44.44 | 7 | 38.89 | 3 | 16.67 |
| MO | M | 53 | 1 | 0 | 0.00 | 1 | 100.00 | 0 | 0.00 |
| MO | F | 47 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| NE | M | 21 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| NE | F | 2 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| OH | M | 4662 | 258 | 119 | 46.12 | 126 | 48.84 | 13 | 5.04 |
| OH | F | 1357 | 87 | 29 | 33.33 | 49 | 56.32 | 9 | 10.34 |
| OK | M | 1255 | 71 | 33 | 46.48 | 27 | 38.03 | 11 | 15.49 |
| OK | F | 306 | 18 | 8 | 44.44 | 10 | 55.56 | 0 | 0.00 |
| OR | M | 2 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| OR | F | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| PA | M | 18 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| PA | F | 3 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| TN | M | 61 | 2 | 2 | 100.00 | 0 | 0.00 | 0 | 0.00 |
| TN | F | 8 | 1 | 0 | 0.00 | 1 | 100.00 | 0 | 0.00 |
| TX | M | 2051 | 128 | 70 | 54.69 | 54 | 42.19 | 4 | 3.13 |
| TX | F | 305 | 28 | 12 | 42.86 | 14 | 50.00 | 2 | 7.14 |
| VA | M | 857 | 36 | 23 | 63.89 | 12 | 33.33 | 1 | 2.78 |
| VA | F | 119 | 7 | 1 | 14.29 | 4 | 57.14 | 2 | 28.57 |
| WV | M | 1904 | 94 | 49 | 52.13 | 42 | 44.68 | 3 | 3.19 |
| WV | F | 319 | 26 | 10 | 38.46 | 13 | 50.00 | 3 | 11.54 |

Total Terminations - 2015

| State | Gender | Active Employees | Total Terms. | Total Terms. Under 30 | % of Total Terms. Under 30 | Total Terms. 30-50 | % of Total Terms. 30-50 | Terms. Over 50 | % of Total Terms. Over 50 |
|-------|--------|------------------|--------------|-----------------------|----------------------------|--------------------|-------------------------|----------------|---------------------------|
| AL | M | 2 | 2 | 0 | 0.00 | 0 | 0.00 | 2 | 100.00 |
| AL | F | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| AR | M | 307 | 10 | 2 | 20.00 | 4 | 40.00 | 4 | 40.00 |
| AR | F | 29 | 3 | 0 | 0.00 | 2 | 66.67 | 1 | 33.33 |
| CA | M | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| CA | F | 1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| DC | M | 3 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| DC | F | 4 | 1 | 0 | 0.00 | 1 | 100.00 | 0 | 0.00 |
| FL | M | 1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| FL | F | 1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| IL | M | 67 | 5 | 0 | 0.00 | 3 | 60.00 | 2 | 40.00 |
| IL | F | 4 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| IN | M | 919 | 107 | 8 | 7.48 | 27 | 25.23 | 72 | 67.29 |
| IN | F | 188 | 20 | 1 | 5.00 | 7 | 35.00 | 12 | 60.00 |
| KS | M | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| KS | F | 1 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| KY | M | 857 | 555 | 158 | 28.47 | 263 | 47.39 | 134 | 24.14 |
| KY | F | 94 | 56 | 2 | 3.57 | 13 | 23.21 | 41 | 73.21 |
| LA | M | 1,155 | 483 | 145 | 30.02 | 215 | 44.51 | 123 | 25.47 |
| LA | F | 256 | 35 | 1 | 2.86 | 18 | 51.43 | 16 | 45.71 |
| MI | M | 1,132 | 60 | 3 | 5.00 | 23 | 38.33 | 34 | 56.67 |
| MI | F | 182 | 11 | 4 | 36.36 | 2 | 18.18 | 5 | 45.45 |
| MO | M | 53 | 54 | 1 | 1.85 | 26 | 48.15 | 27 | 50.00 |
| MO | F | 47 | 46 | 1 | 2.17 | 26 | 56.52 | 19 | 41.30 |
| NE | M | 21 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| NE | F | 2 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| OH | M | 4,662 | 229 | 16 | 6.99 | 69 | 30.13 | 144 | 62.88 |
| OH | F | 1,357 | 65 | 8 | 12.31 | 25 | 38.46 | 32 | 49.23 |
| OK | M | 1,255 | 65 | 5 | 7.69 | 23 | 35.38 | 37 | 56.92 |
| OK | F | 306 | 13 | 2 | 15.38 | 5 | 38.46 | 6 | 46.15 |
| OR | M | 2 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| OR | F | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| PA | M | 18 | 2 | 0 | 0.00 | 0 | 0.00 | 2 | 100.00 |
| PA | F | 3 | 1 | 0 | 0.00 | 1 | 100.00 | 0 | 0.00 |
| TN | M | 61 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| TN | F | 8 | 2 | 0 | 0.00 | 1 | 50.00 | 1 | 50.00 |
| TX | M | 2,051 | 81 | 14 | 17.28 | 23 | 28.40 | 44 | 54.32 |
| TX | F | 305 | 17 | 2 | 11.76 | 5 | 29.41 | 10 | 58.82 |
| VA | M | 857 | 41 | 4 | 9.76 | 9 | 21.95 | 28 | 68.29 |
| VA | F | 119 | 8 | 1 | 12.50 | 0 | 0.00 | 7 | 87.50 |
| WV | M | 1,904 | 157 | 12 | 7.64 | 41 | 26.11 | 104 | 66.24 |
| WV | F | 319 | 27 | 3 | 11.11 | 8 | 29.63 | 16 | 59.26 |

| Turnover - 2015 | | | | |
|-----------------|--------|---------------------|------------------|--------------------|
| State | Gender | % Turnover Under 30 | % Turnover 30-50 | % Turnover Over 50 |
| AL | M | 0.00 | 0.00 | 100.00 |
| AL | F | 0.00 | 0.00 | 0.00 |
| AR | M | 0.65 | 1.30 | 1.30 |
| AR | F | 0.00 | 6.90 | 3.45 |
| CA | M | 0.00 | 0.00 | 0.00 |
| CA | F | 0.00 | 0.00 | 0.00 |
| DC | M | 0.00 | 0.00 | 0.00 |
| DC | F | 0.00 | 25.00 | 0.00 |
| FL | M | 0.00 | 0.00 | 0.00 |
| FL | F | 0.00 | 0.00 | 0.00 |
| IL | M | 0.00 | 4.48 | 2.99 |
| IL | F | 0.00 | 0.00 | 0.00 |
| IN | M | 0.87 | 2.94 | 7.83 |
| IN | F | 0.53 | 3.72 | 6.38 |
| KS | M | 0.00 | 0.00 | 0.00 |
| KS | F | 0.00 | 0.00 | 0.00 |
| KY | M | 18.44 | 30.69 | 15.64 |
| KY | F | 2.13 | 13.83 | 43.62 |
| LA | M | 12.55 | 18.61 | 10.65 |
| LA | F | 0.39 | 7.03 | 6.25 |
| MI | M | 0.27 | 2.03 | 3.00 |
| MI | F | 2.20 | 1.10 | 2.75 |
| MO | M | 1.89 | 49.06 | 50.94 |
| MO | F | 2.13 | 55.32 | 40.43 |
| NE | M | 0.00 | 0.00 | 0.00 |
| NE | F | 0.00 | 0.00 | 0.00 |
| OH | M | 0.34 | 1.48 | 3.09 |
| OH | F | 0.59 | 1.84 | 2.36 |
| OK | M | 0.40 | 1.83 | 2.95 |
| OK | F | 0.65 | 1.63 | 1.96 |
| OR | M | 0.00 | 0.00 | 0.00 |
| OR | F | 0.00 | 0.00 | 0.00 |
| PA | M | 0.00 | 0.00 | 11.11 |
| PA | F | 0.00 | 33.33 | 0.00 |
| TN | M | 0.00 | 0.00 | 0.00 |
| TN | F | 0.00 | 12.50 | 12.50 |
| TX | M | 0.68 | 1.12 | 2.15 |
| TX | F | 0.66 | 1.64 | 3.28 |
| VA | M | 0.47 | 1.05 | 3.27 |
| VA | F | 0.84 | 0.00 | 5.88 |
| WV | M | 0.63 | 2.15 | 5.46 |
| WV | F | 0.94 | 2.51 | 5.02 |

Appendix 19: G4-LA2 - Benefits provided to full-time employees that are not provided to temporary or part-

time employees

Benefits Available to Full and Part-Time Employees

- Medical-including coverage for domestic partners
- Dental-including coverage for domestic partners
- Vision-including coverage for domestic partners
- Health Savings Account (HSA)
- Employee Assistance Plan
- Retirement-defined benefit pension plan
- Savings – 401(k) plan
- Flexible Spending Account (Health Care & Dependent Care)
- Vacation
- Leave of Absence
- Long-term Care Insurance
- Group Legal plan
- Auto/Homeowners/Pet insurance
- Vacation donation program
- Hearing and Vision discount programs
- Travel Assistance program
- Military leave
- Corporate Wellness Program-including Care Management Programs

Additional Benefits Available to Full-Time Employees Only

- Life insurance - including coverage for domestic partners
- Accidental Death & Dismemberment -including coverage for domestic partners
- Holidays/Personal Days Off
- Sick Pay
- Long Term Disability
- Phased Retirement Program
- Educational Assistance
- Adoption Assistance
- Paid Parental Leave
- Dependent scholarships

Appendix 20: G4-LA3 - Return to work and retention rates after parental leave

| | Male | Female | Notes |
|--|--------|--------|--|
| Report the number of employees by gender that were entitled to parental leave. | 15,126 | 3,197 | All full time actively at work male employees are eligible for AEP paternity leave benefits and full time actively at work females are eligible for AEP sick pay benefits. As such, finding the total number of individuals eligible for the benefit can be found by taking a full time headcount as of the end of each month in 2015 and dividing by 12. Please note that for the months of November and December, individuals in the EMO company (River Operations) were not counted as they were divested from AEP as of 11/7/15. |
| | | | |

| | | | |
|---|------------|-----------|---|
| <p>Report the number of employees by gender that took parental leave.</p> | <p>335</p> | <p>14</p> | <p>The number of male employees who took parental leave was determined by querying time reporting within PeopleSoft and determining how many individuals had used the 'PAT' or 'PATF' code during the 2015 calendar year. Individuals who coded PAT or PATF in the EMO company after 11/7/15 were excluded from these counts as they were no longer considered AEP employees at that time.</p> <p>As females do not use the time codes outlined above (their parental leaves can be coded as sick, FMLA and vacation in PeopleSoft) a query was written against the HR Recovery Center's Lotus Notes database looking for individuals who had a leave of absence in 2015 with a pregnancy ICD9 code. (Usually 650 or V22).</p> |
| <p>Report the number of employees who returned to work after parental leave ended, by gender.</p> | <p>335</p> | <p>13</p> | <p>These are the number of employees who both went out on a parental leave in 2015 and returned to work in that same year. To determine males return to work rate the number of individuals who had coded 'PTA' or 'PTAF' in the time reporting system for 2015 were run against a current active employee roster from PeopleSoft. Any individuals who were no longer listed as active were reviewed to see if they had coded regular hours after their last coding of 'PTA' or 'PTAF' hours in 2015. Employees of River Transportation who went out on a leave and did not return due to divestiture were omitted from this result.</p> <p>Females who were listed in the HR Recovery Center Lotus Notes database with a pregnancy ICD9 code were then checked against PeopleSoft time data to see if regular hours had been coded during the month of January 2015. Any individuals who did not have regular hours coded in 2015 were reviewed to see if they had returned to work.</p> |
| <p>Report the number of employees who returned to work after parental leave ended who were still employed 12 months after their return to work by gender.</p> | <p>74</p> | <p>5</p> | <p>Individuals who had their last hours coded to 'PAT' or 'PATF' in January or February 2015 and are still active in PeopleSoft as of February 2016 were considered employed for a year after their leave had ended. Employees who were a part of the River Operations company (EMO) who took leave in Jan or February of 2015 were excluded from these counts as the company was divested from AEP in November of 2015.</p> <p>For females, a query was run against the HR Recovery Center Lotus Notes database looking for individuals who went out on sick pay for maternity leave and had releases from physicians to return to work in the months of January or February. (The employee could have extended that leave past the physician release date due to FMLA or vacation time.) Those individuals were then checked against PeopleSoft to see if they were actively at work by coding regular hours to the time reporting system.</p> |

| | | | |
|---------------------|------|-----|--|
| Return To Work Rate | 100% | 93% | This rate was determined by dividing the total number of employees who had returned to work (question 2.3) by the total number of employees who had taken parental leave (question 2.2). |
| Retention Rate | 98% | 83% | These rates are determined by taking the number of parental leaves that began during the months of January and February of 2015 and dividing by the number of employees still employed at AEP as of February 2016. |

Appendix 21: G4-LA9 - Average hours of training per year per employee

| Employee Category | HOURS | STUD_COUNT | AVG_HOURS |
|--------------------------------|------------|------------|-----------|
| Administrative Support Workers | 20,792.81 | 1,260.00 | 16.50 |
| Craft Workers | 431,304.35 | 6,052.00 | 71.27 |
| Executive/Sr. Level Officials | 4,629.23 | 201.00 | 23.03 |
| First/Mid-Level Officials | 184,158.97 | 3,061.00 | 60.16 |
| Laborers and Helpers | 15,956.81 | 374.00 | 42.67 |
| No EEO-1 Reporting | 22,677.04 | 1,038.00 | 21.85 |
| Operatives | 46,228.22 | 784.00 | 58.96 |
| Professionals | 210,218.05 | 5,125.00 | 41.02 |
| Service Workers | 2,373.83 | 78.00 | 30.43 |
| Technicians | 99,187.37 | 1,693.00 | 58.59 |

Total Hours 1,037,526.68

| GENDER | HOURS | STUD_COUNT | AVG_HOURS |
|--------|------------|------------|-----------|
| F | 98,364.35 | 3,439 | 28.60 |
| M | 939,162.33 | 16,227 | 57.88 |

Appendix 22: G4-LA10 – Programs for skills management and lifelong learning

Training

AEP provides a broad range of training and assistance that supports lifelong learning and transition support. Programs develop knowledge, competencies and learning that collectively benefit our employees, the business objectives of AEP and the communities we serve.

Our knowledge and skills development strategy is accomplished through our processes for ongoing performance coaching, operational skills training, resources supporting our commitment to environment, safety and health (ESH), job progression training, our tuition assistance program, and KEY, our corporate-wide learning management system.

Performance Coaching is an ongoing process designed to increase communication between employees and managers around performance and development. It is divided into three phases: Phase 1 - Plan; Phase 2 - Coach; and Phase 3 - Review. During the planning phase, the employee collaborates with his or her manager to create a performance plan for the year. This plan includes performance goals, competencies and values importance to success, and development goals that can upgrade skills, boost performance and increase job satisfaction. In the coaching phase, the manager and employee meet regularly to discuss progress toward the plan they created. These two-way conversations provide opportunities to recognize positive results, discuss opportunities for improvement and provide new direction. During the review phase, both the employee and manager assess and discuss the employee's performance for the year, focusing on performance goals, competencies and values and development goals.

Operational Skills Training: AEP offers a wide range of skills to ensure skills needed for effective performance and safe operations. Examples include:

Distribution provides the training for technical personnel responsible for designing distribution facilities and enables technicians to be better designers. Distribution also provides distribution line, dispatch and meter training for personnel to enhance performance in safety, reliability, and productivity. AEP's distribution line apprentice training program is certified by the U.S. Department of Labor.

Fossil and Hydro Generation and the Nuclear Generation Organizations provide employee development and learning services for employees in the areas of technical, safety, environmental, business and front line leadership training. Fossil & Hydro Generation has implemented individualized Learning Plans in the Learning Management System based on work location training needs and job responsibilities. The goal is to develop a Learning Culture where employees are involved in their personal development and learning by understanding what training is needed.

AEP's Projects, Controls and Construction (PC&C) Organization conducts a Project Management Certification program focused on basic and advanced project management principles to provide opportunities for individual development as well as to obtain the industry recognized and PMI sponsored, PMP (Project Management Professional) certification. Additionally, PC&C sponsors internal project management courses to enhance the ongoing professional development of project managers within AEP. These courses are consistent with the Project Management Body of Knowledge (PMBOK[®]) and allow PMP (Project Management Professional) credential holders to gain professional development continuing education credit. PC&C also provides formal leadership development and cultural education programs that foster high impact leaders and a high performing culture.

AEP's Generation Engineering Services (GES) Organization provides opportunities for the Professional Engineer (PE) certification, continuing education requirements. The opportunities are based on PE State Board requirements for continuing education, as developed by individual State Legislation. Additionally, GES sponsors internal engineering courses, as well as workshops, to enhance the ongoing professional development of all corporate engineers and technicians.

The AEP Transmission Training Center serves Transmission field employees across eleven states of AEP's service territory. The Training Center's technical program is delivered in training blocks that align with an employee's progression. Students receive a balanced hybrid of electronic-learning, classroom instruction, and dynamic hands on learning activities in an environment that provides for the application of electrical concepts in a fail-safe environment. Special emphasis is placed on developing fundamental and advanced skills with a strong emphasis on safety and human performance error reduction techniques. This unique training environment allows employees to gain operational experiences, as well as correct and learn from errors without negative impacts to business facilities or their safety and well-being.

Transmission provides skills training to Transmission Line Mechanics, Substation Electricians, and Protection and Control Technicians. Classes are designed to train employees from the entry level to the "journey" level of expertise. All technical skills programs at the AEP Transmission Training Center take place on the 14-acre A. Ray King Training Campus, which features operational and simulated 69-kV to 765-kV lines and indoor substations with digital and electromechanical relay protection. An energized 345-kV line is available on the property for live-line and bare hand experience.

Ethics & Compliance offers training to foster an ethical culture, including AEP's Principles of Business Conduct, FERC Standards of Conduct, FERC Affiliate Restriction Rules, Sarbanes Oxley, antitrust, conflicts of interest, and insider trading.

Human Resources offers training and development in leadership skills, diversity, generational differences, and unlawful harassment for all levels of staff. In addition, AEP offers extensive on-line training resources to all employees in the technical, safety, security, business, ethics and personal skill development areas.

Transmission Operations (TOPs) provides training to our real-time Transmission System Operators and Transmission Dispatchers. We use a systematic approach to training which improves the skills of real-time personnel (performing, as appropriate, the functions of Transmission Operator) who are responsible for real-time system operations; which complies with North American Reliability Corporation (NERC) Standards and the applicable Regional Reliability Standards. The training program (initial and continuing) is designed to train employees from the entry level to the "journey" level of expertise. This training program is structured to ensure all operating personnel have an opportunity to learn principles, concepts and specific tasks required to operate the Bulk Electric System.

Resources for ES&H: No aspect of operations is more important than the health and safety of people. Our customers' needs are met in harmony with environmental protection. AEP has implemented a multi-faceted approach to safety and health promotion, including many behavior based initiatives such as:

- HPI (Human Performance Improvement) - Human performance improvement is about helping individuals maintain control of workplace situations through the use of error reduction tools. Training and tools on human performance improvement are regularly being implemented across several areas of American Electric Power.

- Wellness - Healthy living habits are an essential ingredient for healthy employees. For that reason, AEP sponsors a number of programs and initiatives designed to help employees achieve and maintain a healthy lifestyle.
- Safety and Health Management System - SHEMS is an integrated system that allows AEP to manage all safety and health events in one system, resulting in common processes, terminology and information. It allows us to track preventative and corrective actions as well for timeliness.
- Serious Injuries and Fatalities (SIF) - events that meet established criteria and have caused or have the potential to cause severe harm to employees. While our goal is ZERO HARM, by placing emphasis on these 'most severe events' we can eliminate the major contributors that cause the greatest harm to our employees.
- Employee Job Site Observation (EJSO) - observing employees perform their tasks in the field remains a solid safety & health tool. We have begun the use of an electronic version that allows us to more quickly review the information which permits better sorting for trending purposes. Not only do we look at the 'at-risk' activity, which is immediately corrected; we also note the safe activities utilized which in turn are shared accordingly across AEP.
- Hazard Recognition - In order to protect our employees, everyone needs to get better at recognizing hazards. Since hazards are accidents just waiting to happen; through this program, employees are provided tools to recognize and mitigate job site hazards, as well as the accidents and incidents associated with those hazards.
- Risk Assessment - Risk Assessment addresses how to evaluate control measures to protect us from harm while doing our work.
- JHA - Job Hazard Analysis. The JHA tool is a place to capture the tasks, steps, hazards and controls for the most hazardous jobs within Fossil & Hydro.
- JSA - Job Safety/Site Assessment is a process that helps us look at how to perform a job safely from beginning to end.

Job Progression training is defined by each business unit (i.e. Transmission, Distribution, Generation, etc.), specific to position responsibilities and the work environment. As an example, progression in field positions for maintenance, operations, and electrical work takes several years. After an initial new-hire orientation, employees learn their job through classroom training, on-the-job instruction, video instruction, observation, mentoring, and job experience. Advancement criteria can include slot availability, time in grade, skills demonstrations and knowledge testing.

Educational Assistance: To meet the demands of a competitive, technology driven economy, AEP invests in our workforce through our Educational Assistance Program. This program provides financial reimbursement to eligible employees, encouraging them to equip themselves with the training and knowledge they need to excel in their careers at AEP and their lives beyond AEP.

KEY is an on-demand learning management system (LMS) that provides access to learning resources including 24/7 access to online courses, registration for live learning events and tracking and reporting of the training activities. This Web-based system is used to schedule, launch, and track training for employees and contractors.

Transition Assistance:

AEP also provides transition assistance including retirement counseling and severance pay for those whose employment has been involuntarily terminated, typically as part of a restructuring. Severance pay amounts are determined based on years of service. To illustrate, when circumstances such as a plant closing occur, we bring forward special career transition support including job search training/counseling, networking assistance to identify other local employers, and internal job placement and relocation assistance where applicable. These programs benefit the impacted employee, the community in which he/she serves and the overall morale of the workforce.

Cultural Transformation: AEP is involved in a cultural transformation designed to help us be even more effective at living our values and getting even better results. Cultural education increases effectiveness at the individual level, improves team performance, and helps people work together across the organization.

Appendix 23: G4-LA11 – Percentage of employees receiving regular performance and career development reviews

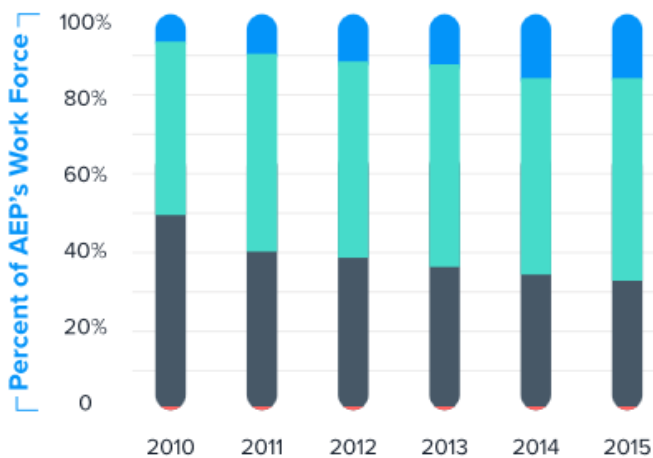
| Gender | Employee’s w/Performance Coaching Forms | Total Employees | % of Total Employee’s with Forms |
|--------------|---|-----------------|----------------------------------|
| Female | 2,720 | 3,134 | 87% |
| Male | 9,019 | 14,334 | 63% |
| Total | 11,739 | 17,468 | 67% |

Appendix 24: G4-LA12 – Composition of governance bodies and breakdown of employees per category

| EEO1 - Description | Total Employees | Male | % Male | Female | Female % |
|--------------------------------|-----------------|-------|--------|--------|----------|
| Executive/Sr. Level Officials | 192 | 169 | 88.02 | 23 | 11.98 |
| First/Mid-Level Officials | 2,844 | 2,523 | 88.71 | 321 | 11.29 |
| Professionals | 4,929 | 3,593 | 72.9 | 1,336 | 27.1 |
| Technicians | 1,688 | 1,548 | 91.71 | 140 | 8.29 |
| Administrative Support Workers | 1,219 | 158 | 12.96 | 1,061 | 87.04 |
| Craft Workers | 5,741 | 5,582 | 97.23 | 159 | 2.77 |
| Operatives | 762 | 691 | 90.68 | 71 | 9.32 |
| Laborers and Helpers | 67 | 60 | 89.55 | 7 | 10.45 |
| Service Workers | 26 | 10 | 38.46 | 16 | 61.54 |

| EEO1 - Description | Total Employees | American Indian | American Indian % | Asian | Asian % | African American | African American % | Hispanic | Hispanic % |
|--------------------------------|-----------------|-----------------|-------------------|-------|---------|------------------|--------------------|----------|------------|
| Executive/Sr. Level Officials | 192 | 1 | 0.52% | 2 | 1.04% | 3 | 1.56% | 6 | 3.13% |
| First/Mid-Level Officials | 2,844 | 28 | 0.98% | 32 | 1.13% | 93 | 3.27% | 101 | 3.55% |
| Professionals | 4,929 | 47 | 0.95% | 205 | 4.16% | 278 | 5.64% | 231 | 4.69% |
| Technicians | 1,688 | 19 | 1.13% | 9 | 0.53% | 69 | 4.09% | 107 | 6.34% |
| Administrative Support Workers | 1,219 | 15 | 1.23% | 9 | 0.74% | 219 | 17.97% | 114 | 9.35% |
| Craft Workers | 5,741 | 81 | 1.41% | 8 | 0.14% | 261 | 4.55% | 479 | 8.34% |
| Operatives | 762 | 11 | 1.44% | 2 | 0.26% | 65 | 8.53% | 79 | 10.37% |
| Laborers and Helpers | 67 | 1 | 1.49% | 0 | 0% | 7 | 10.45% | 1 | 1.49% |
| Service Workers | 26 | 0 | 0% | 0 | 0% | 3 | 11.54% | 1 | 3.85% |

AEP WORKFORCE DEMOGRAPHICS



Appendix 25: G4-LA13 – Ratio of basic salary and remuneration of women to men

| Employee Category | State | Female Average Salary | Male Average Salary | Female/Male % Average Salary | Female Average Remuneration | Male Average Remuneration | Female/Male % Average Remuneration |
|-------------------|-------|-----------------------|---------------------|------------------------------|-----------------------------|---------------------------|------------------------------------|
| | | | | | | | |

| | | | | | | | |
|-------------------------------|----|--------------|--------------|--------|----------------|--------------|--------|
| Executive/Sr. Level Officials | IN | \$0.00 | \$225,678.29 | 0.0% | \$0.00 | \$677,834.68 | 0.0% |
| Executive/Sr. Level Officials | KY | \$0.00 | \$193,614.84 | 0.0% | \$0.00 | \$547,327.11 | 0.0% |
| Executive/Sr. Level Officials | LA | \$332,947.38 | \$200,160.98 | 166.3% | \$1,394,748.31 | \$568,034.57 | 245.5% |
| Executive/Sr. Level Officials | MI | \$0.00 | \$219,919.81 | 0.0% | \$0.00 | \$655,429.72 | 0.0% |
| Executive/Sr. Level Officials | OH | \$278,466.50 | \$258,023.51 | 107.9% | \$980,340.37 | \$949,772.66 | 103.2% |
| Executive/Sr. Level Officials | OK | \$157,711.54 | \$222,458.94 | 70.9% | \$403,204.28 | \$656,411.81 | 61.4% |
| Executive/Sr. Level Officials | TX | \$220,052.37 | \$224,324.04 | 98.1% | \$594,917.94 | \$629,196.09 | 94.6% |
| Executive/Sr. Level Officials | VA | \$0.00 | \$235,731.86 | 0.0% | \$0.00 | \$752,805.39 | 0.0% |
| Executive/Sr. Level Officials | WV | \$0.00 | \$241,451.94 | 0.0% | \$0.00 | \$798,809.06 | 0.0% |
| First/Mid-Level Officials | AR | \$96,706.43 | \$104,347.36 | 92.7% | \$210,346.89 | \$238,056.47 | 88.4% |
| First/Mid-Level Officials | IN | \$100,233.17 | \$101,755.12 | 98.5% | \$226,816.98 | \$233,426.54 | 97.2% |
| First/Mid-Level Officials | KY | \$98,677.92 | \$96,446.23 | 102.3% | \$218,651.98 | \$224,920.92 | 97.2% |
| First/Mid-Level Officials | LA | \$106,265.71 | \$111,197.30 | 95.6% | \$242,432.75 | \$248,624.26 | 97.5% |
| First/Mid-Level Officials | MI | \$112,462.02 | \$116,639.34 | 96.4% | \$263,813.38 | \$283,396.11 | 93.1% |
| First/Mid-Level Officials | OH | \$122,274.76 | \$116,072.05 | 105.3% | \$287,199.73 | \$276,558.64 | 103.8% |
| First/Mid-Level Officials | OK | \$117,768.74 | \$113,741.73 | 103.5% | \$272,412.14 | \$261,749.27 | 104.1% |
| First/Mid-Level Officials | TX | \$108,433.60 | \$108,014.67 | 100.4% | \$250,143.11 | \$248,599.24 | 100.6% |
| First/Mid-Level Officials | VA | \$107,908.71 | \$100,593.50 | 107.3% | \$241,420.87 | \$231,786.32 | 104.2% |
| First/Mid-Level Officials | WV | \$100,051.08 | \$100,641.72 | 99.4% | \$226,808.05 | \$232,043.92 | 97.7% |
| Professionals | AR | \$94,005.68 | \$90,418.48 | 104.0% | \$203,722.18 | \$199,466.98 | 102.1% |
| Professionals | IN | \$72,077.42 | \$85,782.05 | 84.0% | \$153,742.78 | \$188,122.54 | 81.7% |
| Professionals | KY | \$69,030.37 | \$87,102.74 | 79.3% | \$146,724.47 | \$191,700.74 | 76.5% |
| Professionals | LA | \$77,054.83 | \$88,195.98 | 87.4% | \$166,524.93 | \$193,711.50 | 86.0% |
| Professionals | MI | \$80,427.07 | \$97,961.17 | 82.1% | \$175,972.89 | \$224,672.42 | 78.3% |
| Professionals | OH | \$82,452.12 | \$93,446.17 | 88.2% | \$179,413.71 | \$206,410.20 | 86.9% |
| Professionals | OK | \$76,724.92 | \$90,390.50 | 84.9% | \$164,980.46 | \$198,147.07 | 83.3% |
| Professionals | TX | \$81,290.15 | \$85,516.28 | 95.1% | \$176,337.67 | \$188,663.29 | 93.5% |
| Professionals | VA | \$70,509.97 | \$87,592.66 | 80.5% | \$149,965.98 | \$191,342.77 | 78.4% |
| Professionals | WV | \$71,112.20 | \$89,582.93 | 79.4% | \$152,035.99 | \$197,710.07 | 76.9% |
| Technicians | AR | \$58,700.44 | \$75,075.27 | 78.2% | \$124,195.48 | \$164,398.49 | 75.5% |

| | | | | | | | |
|------------------------|----|-------------|-------------|--------|--------------|--------------|--------|
| Technicians | IN | \$63,146.09 | \$68,019.80 | 92.8% | \$138,048.68 | \$158,151.51 | 87.3% |
| Technicians | KY | \$76,772.14 | \$70,783.83 | 108.5% | \$161,569.90 | \$164,288.40 | 98.3% |
| Technicians | LA | \$57,787.81 | \$65,932.09 | 87.6% | \$123,193.81 | \$144,759.10 | 85.1% |
| Technicians | MI | \$75,084.47 | \$76,410.01 | 98.3% | \$174,796.36 | \$176,822.58 | 98.9% |
| Technicians | OH | \$60,295.96 | \$67,393.88 | 89.5% | \$130,735.10 | \$150,927.25 | 86.6% |
| Technicians | OK | \$62,068.65 | \$68,639.49 | 90.4% | \$131,872.05 | \$153,295.81 | 86.0% |
| Technicians | TX | \$54,663.21 | \$69,960.20 | 78.1% | \$121,671.28 | \$159,248.46 | 76.4% |
| Technicians | VA | \$60,932.80 | \$69,500.42 | 87.7% | \$129,987.81 | \$152,788.24 | 85.1% |
| Technicians | WV | \$66,790.28 | \$69,233.51 | 96.5% | \$146,760.76 | \$160,204.09 | 91.6% |
| Administrative Support | AR | \$40,878.92 | \$0.00 | 100.0% | \$85,887.10 | \$0.00 | 100.0% |
| Administrative Support | IN | \$47,809.00 | \$44,500.00 | 107.4% | \$101,041.86 | \$95,738.52 | 105.5% |
| Administrative Support | KY | \$48,530.15 | \$0.00 | 100.0% | \$103,841.52 | \$0.00 | 100.0% |
| Administrative Support | LA | \$40,386.24 | \$37,894.11 | 106.6% | \$85,214.87 | \$81,842.53 | 104.1% |
| Administrative Support | MI | \$46,531.31 | \$46,579.36 | 99.9% | \$102,637.07 | \$100,877.70 | 101.7% |
| Administrative Support | OH | \$44,404.56 | \$38,898.29 | 114.2% | \$93,222.11 | \$81,659.26 | 114.2% |
| Administrative Support | OK | \$40,873.63 | \$38,464.09 | 106.3% | \$85,510.28 | \$80,311.78 | 106.5% |
| Administrative Support | TX | \$42,207.99 | \$40,528.98 | 104.1% | \$89,175.04 | \$85,965.73 | 103.7% |
| Administrative Support | VA | \$50,308.69 | \$41,517.74 | 121.2% | \$104,969.00 | \$86,713.09 | 121.1% |
| Administrative Support | WV | \$40,431.52 | \$37,716.43 | 107.2% | \$85,299.80 | \$79,631.54 | 107.1% |
| Craft Workers | AR | \$66,965.60 | \$71,590.25 | 93.5% | \$142,801.17 | \$165,586.03 | 86.2% |
| Craft Workers | IN | \$54,761.45 | \$65,406.74 | 83.7% | \$121,064.68 | \$155,414.97 | 77.9% |
| Craft Workers | KY | \$0.00 | \$66,519.66 | 0.0% | \$0.00 | \$158,945.01 | 0.0% |
| Craft Workers | LA | \$62,007.40 | \$63,881.17 | 97.1% | \$138,149.93 | \$148,732.73 | 92.9% |
| Craft Workers | MI | \$58,392.00 | \$68,039.31 | 85.8% | \$139,844.28 | \$165,442.93 | 84.5% |
| Craft Workers | OH | \$62,021.86 | \$66,021.41 | 93.9% | \$141,321.50 | \$155,509.18 | 90.9% |
| Craft Workers | OK | \$61,956.27 | \$69,533.89 | 89.1% | \$149,133.58 | \$162,161.22 | 92.0% |
| Craft Workers | TX | \$57,705.76 | \$68,154.65 | 84.7% | \$129,663.70 | \$162,528.32 | 79.8% |
| Craft Workers | VA | \$59,540.00 | \$64,936.67 | 91.7% | \$130,740.59 | \$149,960.60 | 87.2% |
| Craft Workers | WV | \$62,573.30 | \$64,990.13 | 96.3% | \$144,438.09 | \$154,100.21 | 93.7% |
| Operatives | AR | \$51,303.20 | \$64,767.46 | 79.2% | \$114,982.00 | \$148,730.47 | 77.3% |
| Operatives | IN | \$50,463.77 | \$45,799.15 | 110.2% | \$110,540.93 | \$98,942.93 | 111.7% |
| Operatives | KY | \$56,576.00 | \$48,176.42 | 117.4% | \$129,665.63 | \$106,697.82 | 121.5% |
| Operatives | LA | \$0.00 | \$42,784.65 | 0.0% | \$0.00 | \$94,271.50 | 0.0% |
| Operatives | MI | \$61,935.47 | \$57,000.09 | 108.7% | \$145,889.83 | \$127,017.26 | 114.9% |
| Operatives | OH | \$41,474.08 | \$43,461.68 | 95.4% | \$87,890.79 | \$93,712.92 | 93.8% |
| Operatives | OK | \$48,640.80 | \$46,351.85 | 104.9% | \$108,551.23 | \$102,423.51 | 106.0% |
| Operatives | TX | \$46,357.91 | \$57,225.65 | 81.0% | \$101,105.43 | \$131,121.15 | 77.1% |
| Operatives | VA | \$34,054.80 | \$49,316.80 | 69.1% | \$72,823.47 | \$108,541.34 | 67.1% |
| Operatives | WV | \$49,816.00 | \$45,685.57 | 109.0% | \$108,094.03 | \$100,575.61 | 107.5% |

| | | | | | | | |
|----------------------|----|-------------|-------------|--------|-------------|-------------|--------|
| Laborers and Helpers | LA | \$0.00 | \$40,113.50 | 0.0% | \$0.00 | \$81,406.42 | 0.0% |
| Laborers and Helpers | TX | \$36,899.20 | \$37,223.68 | 99.1% | \$78,220.51 | \$84,892.12 | 92.1% |
| Laborers and Helpers | VA | \$15,995.20 | \$0.00 | 100.0% | \$35,633.07 | \$0.00 | 100.0% |
| Laborers and Helpers | WV | \$41,387.35 | \$45,597.83 | 90.8% | \$82,774.70 | \$94,801.63 | 87.3% |
| Service Workers | LA | \$33,112.05 | \$0.00 | 100.0% | \$67,482.44 | \$0.00 | 100.0% |
| Service Workers | WV | \$41,387.35 | \$40,169.91 | 103.0% | \$89,176.07 | \$88,129.15 | 101.2% |

Appendix 26: G4-HR2 - Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained

AEP sponsors a wide variety of training programs for employees and contractors who work on company property to insure a workplace that respects the dignity of people. AEP has received numerous awards from organizations, including receiving multiple awards for maintaining policies and procedures that enable working mothers to care for their children, awards from the National Council for Executive Women that recognizes the extent to which AEP has hired and/or promoted female executives, and an award from the Human Rights Campaign Foundation recognizing AEP for its commitment to lesbian, gay, bisexual, and transgender (LGBT) workplace equality.

All employees receive a copy of the Employee Handbook during the on-boarding process. The Employee Handbook contains a variety of policies, such as AEP's Policy Prohibiting Harassment, AEP's Principles of Business Conduct, and policies that relate to diversity and ethics in the workplace. An updated and revised Employee Handbook was issued in early 2014, which contains these policies. All employees, as part of annual Code of Conduct training, are required to acknowledge responsibility for familiarity and compliance with the handbook and its policies.

The Company also periodically conducts mandatory training programs that address diversity, harassment, and ethics. AEP periodically provides a 30 minute Diversity refresher course to selected business unit employees and contractors.

AEP sponsors periodic harassment training that is designed to educate employees and contractors about the problems associated with workplace harassment issues, and the importance of promptly reporting any conduct that might appear to be objectionable to appropriate supervisory and/or managerial employees. Refresher programs, varying in length from an hour to 90 minutes, are conducted each year to various business unit employees and contractors.

Employees who are promoted to supervisory positions for the first time, are required to complete harassment training and Diversity in the Workplace training.

The AEP Ethics & Compliance (E&C) Department sponsors training programs on a variety of topics under the umbrella of Principles of Business Conduct. All company employees and contractors are required to complete

these training programs.

Number of employees that received training on anti-corruption: 21,642 (99.5%)

Number of employees that received communications on anti-corruption policies and procedures: 21,746 (100%)

Appendix 27: G4-HR3 - Total number of incidents of discrimination and corrective actions taken

In 2015, a total of 13 charges were filed with the EEOC or applicable state agency. The sum of the breakdown exceeds the total number of charges due to the fact that some of the charges allege multiple bases of discrimination. The charge was withdrawn or dismissed in six cases, one charge was withdrawn, and six remain pending.

Disability – 3
Age – 6
Race – 8
Gender – 3
National Origin – 1
Retaliation – 8
Religion - 0

Appendix 28: G4-HR4 – Operations and suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated

All union-represented AEP employees are covered by collective bargaining agreements which contain clauses prohibiting strikes and lockouts. Disputes between the parties may be submitted to binding arbitration before a neutral arbitrator.

Appendix 29: G4-PR5 – Results of surveys measuring customer satisfaction

External customer satisfaction tracking for AEP and its seven operating companies is measured either on a quarterly or semi-annual basis. Residential, Commercial, and Call Center Transactional surveys are fielded continually throughout the year and reported quarterly. Key Accounts surveys are administered and reported semi-annually.

Residential, Commercial and Call Center Transactional surveys are administered via telephone interviews conducted by a third party market research vendor. Use of an independent third party to field these surveys adds to the impartiality and credibility of the data collected as well as providing substantial opportunities to obtain utility industry benchmarking.

Residential and commercial customer satisfaction surveys are fielded using a random selection of active customer records from AEP's customer information system (CIS). Both land line and cellular telephone numbers are included. National “do not call” lists as well as specific AEP “do not call” lists are also integrated into the research vendor’s sample management processes. Quarterly quotas are set at the individual operating company

and state levels.

Commercial customer satisfaction surveys are also fielded using a similar methodology but the sample consists of unmanaged commercial accounts generally with demands of 750 kW or less.

Call Center Transactional customer surveys are administered using completed transaction records obtained nightly from each of AEP’s six call centers. Quotas are set at the individual AEP call center. Key Accounts surveys are administered via an online survey administered by AEP’s Performance Management group and generally consists of 750 kW demand or greater managed commercial and industrial customers.

All four customer satisfaction tracking surveys provide opportunity for those customers to provide feedback to AEP, either anonymously or identified by actual customer. In order to be tagged to a specific customer, the customer must specifically consent to share their identity with AEP. Customer survey feedback is both in the form of responses to quantitative (scaled) survey items as well as qualitative (open-ended) comments. The three quarterly surveys contain a ‘triage’ capability where, if the customer wishes AEP to contact them regarding the source of their dissatisfaction, customer concern forms are generated and communicated to AEP overnight for immediate entry into AEP’s customer complaint database and follow-up. The Key Accounts survey also provides a similar feedback mechanism in the event that a dissatisfied customer is surveyed and agrees to share their particular issues with AEP.

Additional modalities of capturing customer feedback include comments provided to the company through the AEP.com internet site, individual AEP operating company internet sites, e-mail communications, social media posts, letters and telephone calls. Complaints or issues needing remediation are entered into a formal complaints tracking database to ensure timely and thorough follow-up.

| AEP Customer Satisfaction Results | | |
|-----------------------------------|-------------------|--|
| 2015 Survey Results | | |
| Survey Type | Percent Satisfied | Quartile Ranking vs. National Peer Group |
| Residential | 80.8% | 3rd |
| Commercial | 87.2% | 3rd |
| Managed/Key Accounts | 86.6% | N/A |
| Call Center Transactions | 82.0% | N/A |

Percent Satisfied:

Residential and Commercial: Ratings of 6 to 10 on a 0 (Extremely Dissatisfied) to 10 (Extremely Satisfied) rating scale for the question “Based on your overall experience with AEP’s service, how satisfied are you with having

them as your electric company?”

Key Accounts: Percent of 'Consistently Good' and 'Excellent' ratings on a five point rating scale for the question “Please rate how your electric utility performed relative to your expectations.” The five point rating scale for the Key Accounts study is 'Needs Major Improvement', 'Needs Improvement', 'Satisfactory', 'Consistently Good' and 'Excellent'.

Call Center Transactions: Ratings of 6 to 10 on a 0 (Extremely Dissatisfied) to 10 (Extremely Satisfied) rating scale for the question “In summary, thinking about your entire experience with AEP from the time you called until your request was completed, how satisfied were you with this entire transaction experience?”

Quartile Ranking vs. National Peer Group:

Residential and Commercial: Quartile ranking reflects placement relative to national peer group of electric and electric/gas utilities. The members of the benchmarking group differ by survey.

Key Accounts and Call Center Transactions: National benchmarking is not available for these surveys.

Call Center Transactions: National benchmarking is not available for this survey.

Appendix 30: G4-DMA – Demand-side management programs including residential, commercial, institutional and industrial programs.

Energy Efficiency/Demand Response Programs

AEP Ohio

AEP Ohio

- Appliance Recycling
- Behavior Change
- Business Behavior Change
- Codes and Standards
- Community Assistance
- Continuous Improvement
- Custom
- Data Center
- Demand Response
- e3smartSM
- Education & Training
- Efficient Products
- Energy Efficiency Auction
- Express
- Home Retrofit
- New Construction
- New Home

Prescriptive
R&D
Retro-commissioning
Self-Direct

AEP TX

TCC

A/C Distributor Pilot MTP
Commercial Solutions MTP
Commercial SOP
CoolSaver A/C Tune-Up Pilot MTP
Efficiency Connection Pilot MTP
EM&V
Hard-To-Reach SOP
High Performance New Homes MTP
Irrigation Load Management MPT
Load Management SOP
Open MTP
R&D - Programs
Residential SOP
SCORE/City Smart MTP
SMART Source Solar PV MTP
Target Low-Income EE Program

TNC

A/C Distributor Pilot MTP
Commercial Solutions MTP
Commercial SOP
Efficiency Connection Pilot MTP
EM&V
Hard-To-Reach SOP
Irrigation Load Management MPT
Load Management SOP
Open MTP
R&D - Programs
Residential SOP
SCORE/City Smart MTP
SMART Source Solar PV MTP
Target Low-Income EE Program

APCO

VA

Direct Load Control
Low Income

Wheeling

- Appliance Recycling
- C&I Lighting
- C&I Prescriptive
- Custom C&I
- Direct Load Control
- Efficient Products
- Low Income Weatherization
- Manufactured Homes
- Residential Home Retrofit
- Targeted Low Income
- Training & Education

WV

- Appliance Recycling
- C&I Lighting
- C&I Prescriptive
- Custom C&I
- Direct Load Control
- Efficient Products
- Low Income Weatherization
- Manufactured Homes
- Residential Home Retrofit
- Targeted Low Income
- Training & Education

I&M

Indiana

- Budgeting & Accounting Support
- C&I Audit & Small Business Direct Install (SBDI)
- C&I Custom Incentives Program
- C&I Prescriptives Program
- Electric Energy Consumption Optimization (EECO)
- Information & Technology Systems
- Marketing & Customer Awareness
- New Program Development
- Planning & Analytic Support (EM&V)
- Potential Studies
- Residential Appliance Recycling
- Residential Energy Efficient Products
- Residential Home Energy Reports
- Residential Low Income Weatherization
- Residential New Construction

Residential Online Audit
Residential Peak Reduction Program
Residential Schools Energy Education
Residential Weatherization
Staff Development & Memberships

Michigan

C&I Comprehensive Custom Plan
C&I Comprehensive Prescriptive Plan
C&I Educational Services Program
C&I EM&V
C&I Geotargeting Pilot Program
C&I Performance Incentive - CLEAResult
C&I Pilots Program
C&I TPA Services
Electric Energy Consumption Optimization (EEO)
I&M C&I Administration
I&M Residential Administration
Residential Comprehensive Program
Residential Educational Services Program
Residential EM&V
Residential Geotargeting Pilot Program
Residential Low Income Program
Residential Performance Incentive - CLEAResult
Residential Pilots Program
Residential TPA Services

KPCO

Kentucky

Appliance Recycling
Commercial High Efficiency Heat Pump/AC
Commercial Incentive
Community Outreach Compact Fluorescent Lighting
Energy Education for Students
General Administrative and Promotion Commercial
General Administrative and Promotion Residential
High Efficiency Heat Pump
Mobile Home High Efficiency Heat Pump
Mobile Home New Construction
Modified Energy Fitness
Residential Efficient Products
Residential Home Performance
School Energy Management

Targeted Energy Efficiency

PSO

Oklahoma

Business Demand Response
Energy Saving Products & Services
High Performance Businesses
High Performance Homes
Home Weatherization

SWEPSCO

Arkansas

Arkansas Weatherization Program (AWP)
C&I SOP/Targeted Commercial
Energy Efficiency Arkansas (EEA) - Statewide Program
ENERGY STAR Appliance Program (RESAP)
Home Performance with ENERGY STAR (HPES)
Load Management SOP
Online Audit Tool
Regulatory
Residential Lighting Program
Residential SOP (RSOP)
Small Business Direct Install (SBDI) Program

Louisiana

Income Qualified
Large Commercial & Industrial
Residential Solutions
Small Business

Texas

Commercial Solutions Pilot MTP
Commercial SOP
CoolSaver©
EM&V
Hard-To-Reach SOP
Load Management SOP
On-Line Home Energy Checkup
OPEN (SBDI)
R&D
Residential SOP
SCORE MTP

Appendix 31: G4-EU12 – Transmission and distribution losses

An energized transmission line carrying load incurs power losses due to heating and so-call "corona" effects. Heating (or resistive) losses increase linearly with line resistance and quadratically with loading. Corona losses result from undesirable discharge of electric energy, which can be visible and/or audible especially during rain, caused by air ionization around line conductors and hardware. Corona losses increase with voltage level and elevation above sea level of the line.

The following statistics characterize EHV transmission lines operating at different voltages, in normal weather, carrying 1,000 ME of power:

| | Resistive | Corona* | Total | |
|---|-----------|---------|-------|--------|
| 765 kV line @1000 MW LOAD: | | | | |
| Original 4-conductor ("Rail") bundle | 4.4 | 6.4 | 10.8 | -1.10% |
| Newer 4-conductor ("Dipper") bundle | 3.3 | 3.7 | 7.0 | -0.70% |
| Current 6-conductor ("Tern") bundle | 3.4 | 2.3 | 5.7 | -0.60% |
| Planned 6-trapezoidal cond. ("Kettle") bundle | 3.1 | 2.3 | 5.4 | -0.50% |
| 500 kV LINE @1000 MW LOAD" | | | | |
| Typical 2-conductor bundle | 11.0 | 1.6 | 12.6 | -1.30% |
| 345 kV LINE @1000 MW LOAD: | | | | |
| Typical 2-conductor bundle | 41.9 | 0.6 | 42.5 | -4.20% |

*Yearly average corona loss at sea level based on 20%/2%/78% rain/snow/fair weather conditions, respectively.

The markedly superior transmission efficiency of 765 kV transmission is attributable to its higher operating voltage and thermal capacity/low resistance compared to 500 kV and 345 kV. Furthermore, by unloading the underlying, lower-voltage systems with higher resistance, overall system losses are reduced.

Impacts of Transmission Facilities

The biodiversity impacts of transmission facility installation are often obvious. Construction activity, such as clearing vegetation and moving earth to build new facilities, totally removes or drastically decreases onsite biodiversity. These impacts are typically short-term, lasting only until the vegetation returns to the area, however, siting transmission line corridors can affect biodiversity through habitat fragmentation and alteration. The transmission corridors themselves may fragment the habitat, possibly preventing the movement of certain animals from one side to the other, due to the cleared vegetation. Transmission line rights-of-way often require tree removal for construction and maintenance. A variety of methods are used to maintain transmission corridors, such as mowing, hand cutting, trimming and herbicide use, to keep trees from growing into power lines and causing hazards and service interruptions. This loss of trees is also a loss of habitat for woodland and forest fauna and the biodiversity within these areas is altered, but in the process, new habitats are created that

are favored by a different group of plants and animals. These areas often become habitat for grass and shrub dependent species that have often lost habitat to other development, e.g., residential, commercial, industrial, agricultural, etc.

Transmission lines and related structures can also create collision hazards for birds. Avian interactions with transmission lines and structures are species and site specific. AEP has traditionally responded to animal-related incidences at its transmission and distribution facilities when they become evident. For example, the company became aware of a line that crossed a breeding colony of black skimmers in coastal Texas. Fledglings from the colony were being lost for a number of reasons, one of which was collisions with this line. As a deterrent, spiral marking devices were applied to the line, and according to the Audubon Society members that monitor the colony, the collision rate diminished to a level that no longer endangered the colony.

AEP continues monitoring transmission lines in a manner similar to that described above, trying to understand which birds are most susceptible to various lines. For example, the U.S. Fish and Wildlife Service required AEP to install marking devices on some spans of newly constructed transmission lines to prevent avian collisions. A line in the migratory flyway of the whooping crane was marked with aviation balls along approximately 40 miles of its length for this purpose, as was 6 miles of another line in the Attwater's prairie chicken historic habitat (Appendix 4). Both bird species are endangered. Spiral markers have been installed on newly built transmission line spans that cross bays, estuaries, wetlands or other water bodies, at the request of the permitting authorities who thought the new lines could pose a collision potential to birds in general. At the request of the USFWS's Whooping Crane Coordinator at the Aransas National Wildlife Refuge, Texas, AEP marked approximately a mile of line that whooping cranes had been observed crossing in their descent to a wildlife feeder (Appendix 4). The USFWS sees the resulting collision risk as a significant threat to the slowly recovering and only natural, self-sustaining population of whooping cranes.

Bird electrocutions occur on utility poles and towers as birds use these structures for perching, roosting and nesting. Fulfilling a commitment made in 2008 and to address situations such as those described above, AEP has completed the development of a system-wide Avian Protection Plan (APP). The intent of the APP is to comply with federal regulations, reduce the incidences of bird electrocutions and collisions with AEP-energized equipment, and to reduce the frequency of bird-caused outages. AEP applies protective devices to structures when outages have been caused by bird electrocutions and is building a database that will enable the identification of high risk structures so preventive measures may be taken.

The APP is a vehicle agreed to by the electric utility industry, represented by the Edison Electric Institute (EEI) Avian Power Line Interaction Committee (APLIC), and the U.S. Fish and Wildlife Service (USFWS), through which a utility company can comply with federal bird protection laws enforced by the USFWS.

Thermal Discharges

AEP operates several coal-fired power plants that utilize once-through cooling of heated condenser water formed by waste heat in the steam cycle. The condenser water is cooled by passive heat transfer as water withdrawn from a river or lake is pumped into the condenser and returned (at a higher temperature) to the source waterbody. The potential ecological impacts of this heated water are addressed in each plant's NPDES permit. Many of the AEP plants utilizing once-through cooling have an approved Clean Water Act Section 316(a) variance, which signifies that a state regulatory agency has concluded that a balanced, indigenous biological community will be maintained in the source waterbody despite the discharge of cooling water at temperatures in excess of applicable water quality temperature criteria. Routinely, state agencies require that AEP provide a

re-justification of this finding, based on recent water quality and biological studies. AEP voluntarily conducts ecological assessments at some once-through cooled power plants located on the Ohio River as part of an ongoing Ohio River Ecological Research Program.

The potential impacts of heated cooling water on biodiversity range from insignificant to temporarily significant, depending on prevailing river flow and ambient temperature conditions. During extreme drought events, the heated water can cause a temporary displacement of thermally-sensitive fish species in the immediate area where the thermal discharge mixes with the source waterbody. Typically, the biodiversity "balance" is restored after the extreme river flow and temperature conditions are removed. It should be noted that a long-term balanced biodiversity condition (despite temporary displacement of some species during rare environmental conditions) is one of the conditions that a discharger must demonstrate to a state agency in order to receive an approved 316(a) variance.

As an outcome of the final 316(b) and other rulemakings, AEP has closed several once-through cooled facilities and may be required to retrofit improved fish protection equipment at the remaining once-through cooled facilities. Such changes will reduce or eliminate potential impacts to thermally sensitive fish.

Source Information - FERC hydro relicensing studies; AEP Corp of Engineer 404 compliance programs (wetland mitigations); AEP Avian Protection Program. Cooling water intake impacts determined from plant 316(b) studies.

Appendix 32: G4-EU13 – Biodiversity of offset habitats compared to the biodiversity of the affected areas

If forested, freshwater or wetland ecosystem areas must be disturbed during the construction of new facilities, efforts are made to minimize the amount of habitat that is impacted. Once construction starts, disturbed areas that are of ecological value are replaced through compensatory mitigation.

AEP is required by the Clean Water Act to restore and maintain wetlands or habitat near lakes and rivers that are lost or destroyed due to the construction of new facilities. In the past, no data were available on the biodiversity of replacement forested or landscape areas, however, the Ohio Environmental Protection Agency (OEPA) conducted a comparison of mitigation and natural wetlands during 1995 (Fennessy and Roehrs 1997). In this assessment, the 20-acre wetland mitigation site at the Gavin Plant in Gallia County, OH, was assessed.

The Gavin mitigation wetlands were created in 1993 to replace those that were lost due to the construction of an FGD landfill. The OEPA reported that, "there was not a single case where a wetland impact had occurred and a corresponding mitigation project had not been done" (Fennessy and Roehrs 1997). This is consistent with how AEP mitigates disturbed habitats. It was also noted that there has been a surplus acreage for every acre of wetland impact. In other words, there is a net gain of wetland acreage, however, the minimum required mitigation acres were not always achieved. AEP was required to create 15 acres of wetlands at the Gavin site, while only 7.6 acres were achieved. It is believed that excess open-water areas decreased the amount of available wetlands.

While no significant differences were found in the diversity of wetland plants, there was a decrease in the diversity of native plants associated with the mitigation projects (Fennessy and Roehrs 1997). The Gavin site had 76% native plant species, while the average percent native species at the natural wetlands was 88%. In addition, the Gavin site is 50% open water, as compared to an average of 25% open water for the natural sites.

The study also found that mitigation projects, in general, do not measure up to natural sites with respect to flood-water retention, water quality improvement and habitat provision (Fennessy and Roehrs 1997). For example, at the Gavin site, 60% of soil samples were indicative of hydric soils, while an average of 80% of natural wetland samples indicated hydric or wetland-type soils. This could have been due to the young age of the mitigation wetlands (only 2 to 5 years old) at the time of the study and it was believed that this condition would improve as the wetlands age.

Source Information - Fennessy, S. and J. Roehrs. 1997. A functional assessment of mitigation wetlands in Ohio: Comparisons with natural systems. State of Ohio Environmental Protection Agency, Division of Surface Water. Columbus, OH.

Appendix 33: G4-DMA – Programs and processes to ensure availability of a skilled workforce

Processes to ensure retention and renewal of skilled workforce:

AEP's operations require a highly skilled workforce to perform a wide range of roles in a safe and efficient manner. To ensure the availability of the skilled workforce required, AEP uses a variety of programs or processes. Uses of these are dependent on individual business unit / department needs.

Attraction programs or processes:

- Troops to Energy - AEP is participating in an effort to link veterans leaving military service to job openings in the energy industry
- Recruiting Friendly Policies
- Pre-employment Skill Development through Training Alliances / School partnerships and Co-op / Internship Programs
- College Relations & Recruiting
- Recruiting
- Utilization of our Employee Resource Group (ERG) members at diversity recruitment venues
- Connection with the Center for Energy Workforce Development and involve in some state consortium
- Leverage our membership in DirectEmployers, an employment network that reaches a diverse workforce

Development programs or processes:

- Skill / Knowledge Development (including Technical Training Programs / Apprenticeships and Professional License & Certificates)
- Tuition Assistance - encourages employees to grow their knowledge and expertise
- Knowledge Transfer / Management (including Communities of Practice)
- Development Opportunities (through development planning, job rotations, special assignments, online learning)
- Leadership Development
- Succession Planning & Targeted Development Programs
- Mentoring Programs including our Legacy of Knowledge program.
- Employee Resource Group (ERG) Professional Development Programs

Retention programs or processes:

- Performance Coaching
- Culture Improvement Activities
- Total Compensation Package

- Employee Activities
- Company Benefits including Health & Wellness and Work / Life Programs
- Various recognition programs

Technical School Alliances:

<http://aep.com/careers/collegerelations/techschool.aspx>

AEP has training alliances with various vocational and technical schools across our [11 state service territory](#). We work with these institutions to develop academic programs needed to prepare students for high-paying jobs in the utility industry. Internships may be available in partnership with some technical schools, depending on opportunities in each AEP location. Found below are academic programs offered:

- Alliance Railcar program prepares you to become a railcar car mechanic, performing various all-position welding operations and truck component rebuilds.
- Line Training program prepares you to work as lineman in the construction, maintenance, and repair of electric utility overhead and underground systems.
- Power Plant Technology program prepares you to perform basic equipment operating and maintenance functions required in electric utility power plants and other related industries.
- Transmission programs prepare you to become a transmission line mechanic, station electrician, station equipment specialist or electronic controls technician.
- Electrical Power Generation/Transmission/Distribution Dispatch program prepares you to become an electrical power generation dispatcher, transmission dispatcher, or distribution dispatcher. This program provides you with the basic concepts of the national power system, including production, transmission, distribution, and the power market.
- Nuclear Uniform Curriculum program prepares you for an entry level position in Radiation Protection, Operations, or Maintenance (Electrical, Mechanical, or Instrumentation and Controls).

School Alliances

For more information, please contact the admissions counselor at your desired campus.

Arkansas

- [University of Arkansas at Hope](#), Power Plant Technology Program
- [University of Arkansas at Fayetteville](#), Engineering Program

Indiana

- [Project Lead the Way](#), Engineering and Manufacturing Programs
- [Ivy Tech Community College](#), Power Plant Technology Program

Kentucky

- [Ashland Community College](#), Transmission and Line Training Programs

Michigan

- [ITT Technical Institute](#), Transmission and Line Training Programs
- [Lake Michigan College](#), Nuclear Uniform Curriculum

Nebraska

- [Northeast Community College](#), Alliance Railcar Program
- [Western Nebraska Community College](#), Alliance Railcar Program

Ohio

- [Belmont College](#), Power Plant Technology Program
- [Career & Technical Education Center \(C-Tec\)](#), Line Training Program
- [Columbus State Community College](#), Line Training Programs, Electrical Power Generation/Transmission/Distribution Dispatch Program

- [Delaware Career Center](#), Line Training Program
- [Eastern Gateway Community College](#), Power Plant Technology and Distribution Line Training Programs
- [Mid-East Career & Technical Center](#), Line Training Program
- [Owens Community College](#), Transmission and Line Training Programs
- [Pickaway-Ross Vocational School](#), Line Training Program
- [Scioto County Career Technical Center](#), Line Training Program
- [Stark State](#), Engineering Technology Program (Transmission-Station)
- [The Career Center at Marietta](#), Power Plant Technology Program
- [Tri-County Career Center](#), Line Training Program (High School Program)
- [University of Rio Grande](#), Power Plant Technology & Maintenance Programs
- [Warren County Career Center](#), Line Training Program
- [Washington State Community College](#), Power Plant Operator Program
- [Zane State](#), Engineering Technology Program (Transmission-Station and Power Generation)

Oklahoma

- [Oklahoma State University Institute of Technology](#), Power Plant Technology and Line Training Programs

Texas

- [Texas A&M - Texarkana](#), Engineering Program
- [Texas State Technical College](#), Transmission, Line Training, and Power Plant Technology

West Virginia

- [Mid-Ohio Valley Center \(Marshall University\)](#), Power Plant Maintenance Program
- [New River Career Center](#), Transmission and Line Training Programs
- [West Virginia Northern Community College](#), Power Plant Technology Program

Wyoming

- [Eastern Wyoming College](#), Alliance Railcar Program

Appendix 34: G4-EU15 – Percentage of employees eligible to retire in the next 5 and 10 years broken down by job category and by region

Employees’ eligible to retire in the next 10 years attaining age 55 and ten years of service. This is based on our retiree medical eligibility.

| Work State | Executive/ Sr Level Officials | First/Mid- Level Officials | Professionals | Technicians | Office and Clerical | Craft Workers (Skilled) | Operatives Semi-Skilled | Laborers Unskilled | Service Workers |
|------------|-------------------------------------|----------------------------------|---------------|-------------|---------------------------|-------------------------------|----------------------------|-----------------------|--------------------|
| AR | | 64% | 42% | 29% | 50% | 23% | 4% | | |
| IN | 67% | 65% | 54% | 48% | 55% | 41% | 24% | | |
| KY | 100% | 75% | 54% | 66% | 81% | 50% | 33% | | |
| LA | 100% | 74% | 49% | 55% | 27% | 39% | 14% | | 100% |
| MI | 60% | 48% | 48% | 45% | 51% | 24% | 33% | | |
| OH | 58% | 56% | 36% | 39% | 46% | 37% | 23% | | |
| OK | 89% | 61% | 43% | 37% | 33% | 33% | 23% | | |
| TN | | 62% | 69% | 45% | 75% | 26% | 33% | | |
| TX | 100% | 66% | 49% | 44% | 48% | 41% | 38% | 100% | |
| VA | 50% | 73% | 51% | 58% | 69% | 47% | 39% | 100% | |
| WV | 100% | 72% | 54% | 39% | 30% | 44% | 18% | 5% | 63% |

Employees' eligible to retire in the next five years attaining age 55 and ten years of service. This is based on our retiree medical eligibility.

| Work State | Executive/Sr Level Officials | First/Mid Level Officials | Professionals | Technicians | Office and Clerical | Craft Workers (Skilled) | Operatives (Semi-Skilled) | Laborers (Unskilled) | Service Workers |
|------------|------------------------------|---------------------------|---------------|-------------|---------------------|-------------------------|---------------------------|----------------------|-----------------|
| AR | | 77% | 64% | 53% | 57% | 43% | 19% | | |
| IN | 83% | 81% | 67% | 59% | 69% | 49% | 31% | | |
| KY | 100% | 94% | 67% | 77% | 88% | 63% | 42% | | |
| LA | 100% | 84% | 60% | 73% | 40% | 56% | 20% | | 100% |
| MI | 87% | 70% | 64% | 60% | 74% | 39% | 41% | | |
| OH | 79% | 72% | 52% | 52% | 62% | 48% | 35% | | |
| OK | 100% | 78% | 61% | 54% | 55% | 44% | 40% | | |
| TN | | 69% | 77% | 55% | 75% | 37% | 33% | | |
| TX | 100% | 77% | 62% | 58% | 66% | 52% | 45% | 100% | |
| VA | 100% | 92% | 65% | 73% | 75% | 56% | 52% | 100% | |
| WV | 100% | 85% | 66% | 52% | 51% | 55% | 22% | 19% | 92% |

Appendix 35: G4-DMA – Policies and requirements regarding health and safety of employees and employees of contractors and subcontractors

We have 65 Safety & Health policies and procedures all of which are listed on a Safety & Health intranet web page for easy reference. Employees are educated/trained in these policies and procedures which are applicable based on job classification and/or work assigned. Employee training is managed and tracked in a Learning Management System (LMS). Contractors' training requirements are addressed in our Service Agreements and Contracts as terms and conditions. Contractors have to acknowledge the training their employees receive as they are being considered for work for American Electric Power. In some situations that require specialty requirements, such as, asbestos abatement, the contractors' have to present certification that their training has taken place and is up-to-date.

Safety & Health continues to review these on an annual basis and works with the business units to assure contractors are aware of these requirements.

Appendix 36: G4-DMA – Approach to managing the impacts of displacement

When, in the course of expanding or creating new generation or transmission facilities, AEP finds it necessary to acquire property, the company seeks to ensure that no economic displacement occurs. If properties are purchased for company use, AEP endeavors to enter into purchase agreements that compensate property owners in a fashion that precludes economic displacement.

Appendix 37: G4-EU22 – Number of people physically or economically displaced

| Grantee | Section | Property Name | Number Of People Displaced |
|---------|---------|---------------|----------------------------|
| | | | |

| | | | |
|--------------|-------|-----------------------------------|-----------|
| APCo | TRANS | Chemical Turner 45kV Line Rebuild | 2 |
| APCo | TRANS | Chemical Turner 45kV Line Rebuild | 6 |
| APCo | TRANS | Chesterfield Station | 3 |
| APCo | DIST | Washington Street 45kV Substation | 1 |
| I&MTransco | TRANS | Lincoln Decatur 69kV | 1 |
| KYTransco | TRANS | Stanville 138 kV Station | 5 |
| WVTransco | TRANS | Yukon 138kV Substation | 2 |
| WVTransco | TRANS | Yukon 138kV Substation | 1 |
| TCC | TRANS | Not yet named | 2 |
| | | | |
| Total | | | 23 |

Appendix 38: G4-DMA – Practices to address language, cultural, low literacy and disability related barriers to accessing and safety using electricity and customer support services

AEP utilizes multiple communication channels to address the needs of all customer classes. For example, AEP provides a toll free TDD (Telecommunications Device for the Deaf) service that is available 24/7 for hearing impaired. All customers are able to access their AEP operating company website to perform a variety of functions: view bill, sign up for paperless billing, account balance information, payment and usage history, start/stop service, update phone number, mailing address, report power outages and make payments on their accounts. AEP allows for multiple payment options. Customers take advantage of our Third Party vendors offering translation in a variety of languages. AEP also prints Braille bills and Large Print bills for the visually impaired. The monthly customer bill messaging and inserts notify customers of many energy efficiency programs and other products and services.

- Customers are able to communicate with AEP via online, IVR, phone, email, mail and fax
- A TDD message is displayed on bills and bill backer forms.
- All websites give access to the above stated functions.
- Customers are able to make payments by phone, mail, at authorized paystations, electronically through their financial institution, through their operating company website or by participating in a checkless payment plan.
- Our Third Party Vendor translating a variety of languages is Language Select. Braille bills are processed through a vendor; The League of the Blind and Disabled. Large Print Bills are handled in-house.
- The Regulatory, Marketing, Energy Efficiency Programs and Corporate Communications groups submit bill messages and inserts.

Appendix 39: G4-EU27 – Number of residential disconnects for non-payment

| <u>Category</u> | <u>Count</u> |
|--------------------|--------------|
| Less than 48 hours | 225,739 |
| 48 hrs to 1 week | 26,421 |
| More than 1 week | 108,103 |

Residential disconnects for non-payment Jan thru Dec 2015, regulated companies, routine disconnects (excludes disconnects at pole, service, transformer, etc). Note: the category ">1 Week", represents accounts that were 1)

finalized because AEP automatically closes an account that has been disconnected for 1 week or 2) a "new" customer applied for service which results in a "new" account being established when service was connected.